FIRE PROTECTION PLAN
FOR
DO MINOR SUBDIVISION
TPM 20976
APN 108-081-06

PREPARED FOR:

Tony Do
405 Ranger Road
Fallbrook, CA 92028

PREPARED BY:

Robin Church
RC Biological Consulting, Inc.
4215 Spring Street
Suite 321
La Mesa, CA 91941
(619) 463-1072

September 2006
Revised July 2007
Revised September 2008

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1.0 INTRODUCTION

The proposed project is a minor subdivision of a twenty gross acre parcel into four parcels and a remainder parcel. The proposed parcels range in size from 4.04 acres to 4.64 acres. The project is located in the Community of Fallbrook, in north San Diego County, west of Interstate 15 and north of Highway 76 off of Ranger Road (Figure 1). The project area is located in Section 22, Township 9 South, Range 3 West on the Temecula 7.5' USGS Quadrangle (Figure 2). The project is located within the state responsibility area (Figure 3).

The purpose of this Fire Protection Plan (FPP) is to meet the requirements of the North County Fire Protection District regarding fire safety in the urban-wildland interface for the Do Minor Subdivision, TPM 20976. Article 86 of the 2001 edition of the California Fire Code indicates that a Fire Protection Plan shall be required for all new development within the Urban-Wildland Interface.

The following Fire Protection Plan addresses water supply, access, building ignition and fire resistance, fire protection systems and equipment, defensible space and vegetation management in accordance with the requirements of Article 86. When developing mitigation measures the location, topography, geology, flammable vegetation and climate were taken into consideration.

2.0 WATER SUPPLY

The North County Fire Protection District letter dated November 18, 2005 requires two residential type fire hydrants be installed in accordance with the North County Fire Protection District and San Diego County Standards (Appendix A). The North County Fire Protection District (NCFPD) letter dated December 22, 2006 requires three additional residential type fire hydrants to be installed at the intersection of Ranger Road and the to-be-named access road and along Ranger Road at approximately 1500 feet intervals where the waterline touches Ranger Road (Appendix A). One existing fire hydrant occurs near the northeast corner of the project boundary. The NCFPD letter dated August 1, 2007 requires two more hydrants along the access road approximately every 500 feet on the north side of the road. The systems shall be capable of supplying 1500 gallons per minute with 2500 gallons per minute available in the mains. All components must meet the approval of the North County Fire Protection District. Design of the water supply, type and location of the fire hydrants must be submitted to the Fire Chief for approval prior to the recordation of the map. As indicated in the preliminary grading plan (map pocket), the project shall meet the water supply requirements by providing three residential type fire hydrants onsite that shall serve the property. The hydrants shall be located approximately every 500 feet along the to-be-named access road, and prior to the radius of the cul-de-sac. Figure 4 shows the locations of the proposed and fire hydrants located along Ranger Road and the access road. The hydrants will be equipped with drip caps and blue dot markers and shall be installed and tested prior to bringing any combustible building materials onsite. These conditions have been approved in a letter

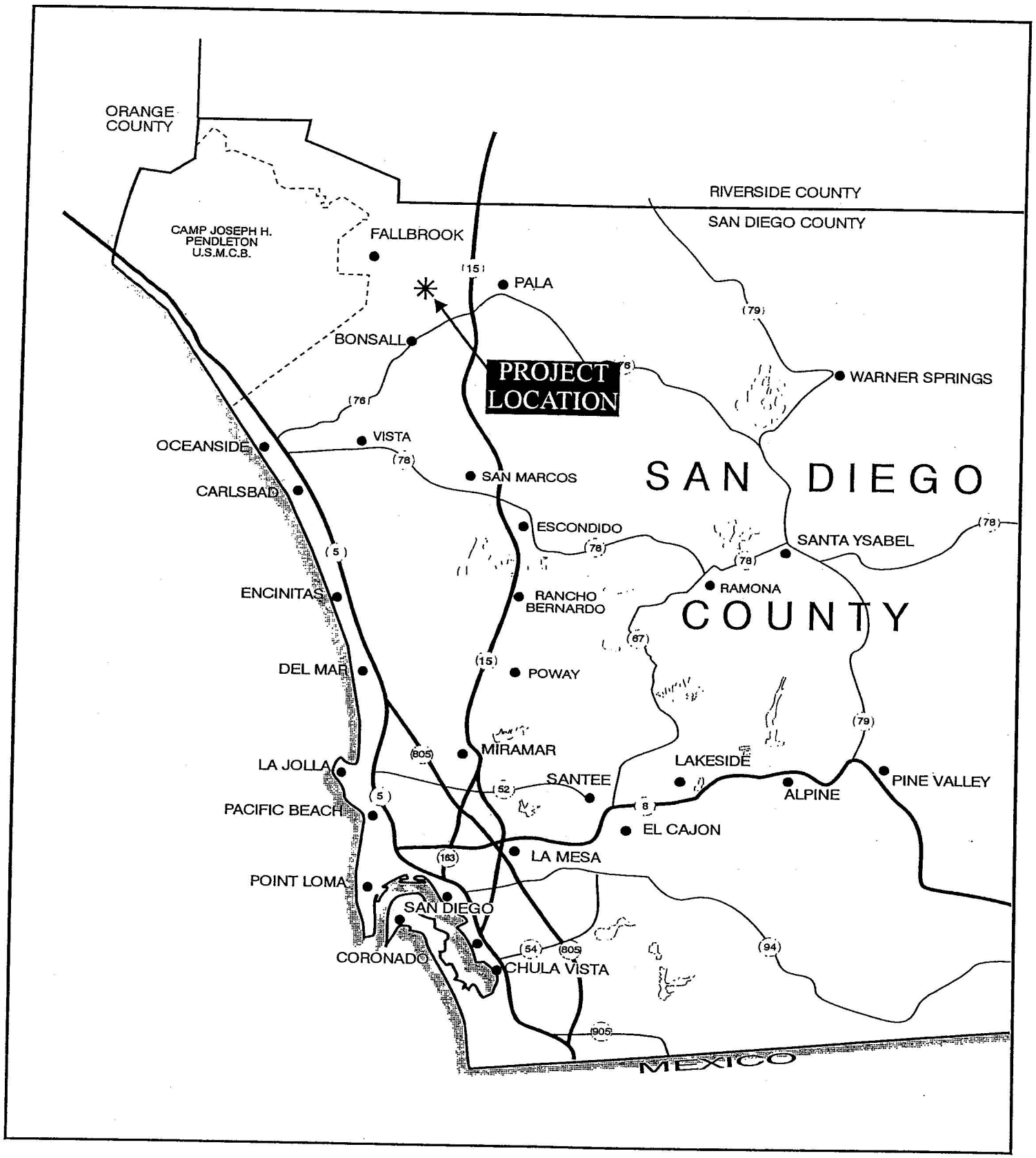
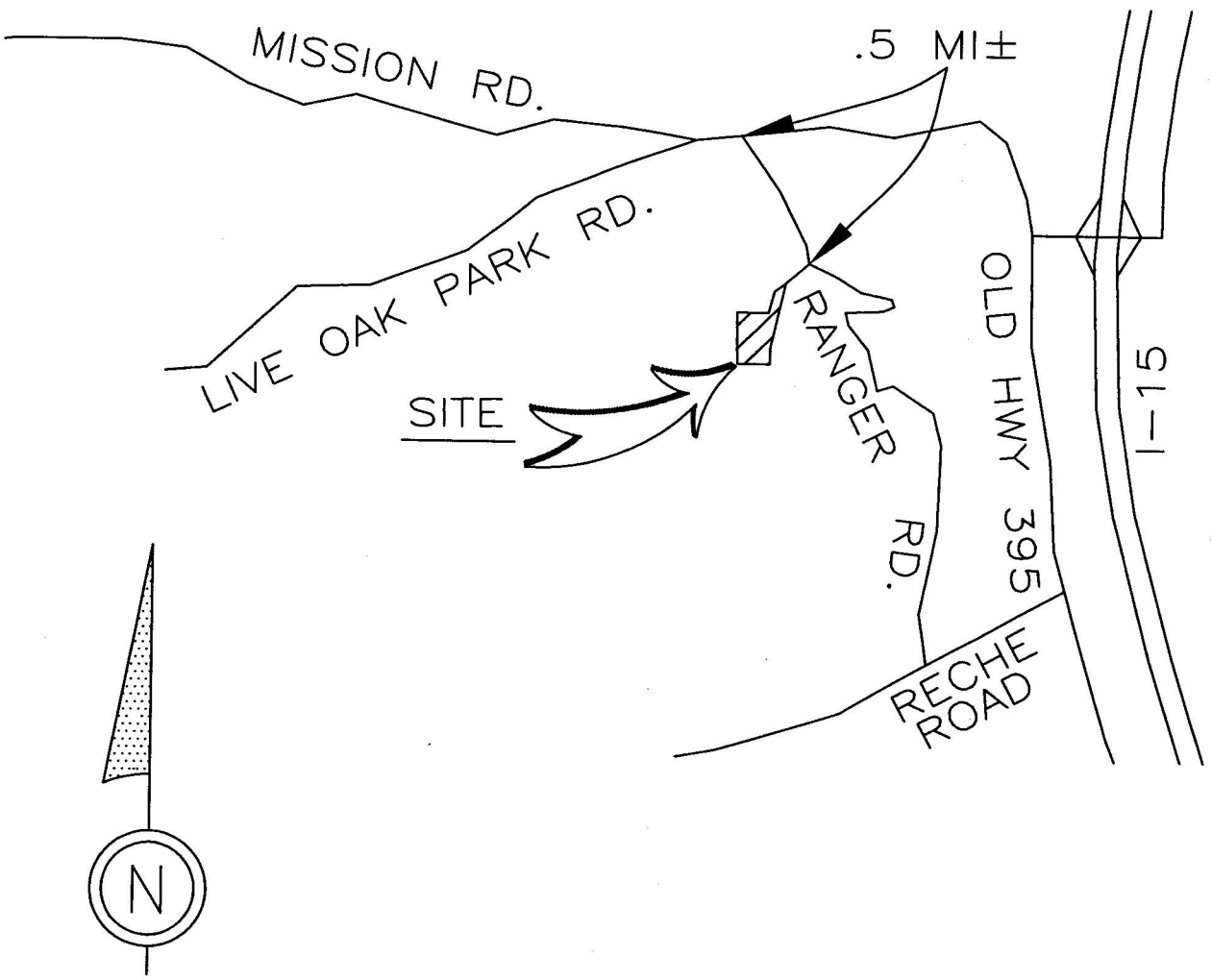


Figure 1
Regional Location Map



NO SCALE

RC Biological Consultants	Vicinity Map	Figure 2

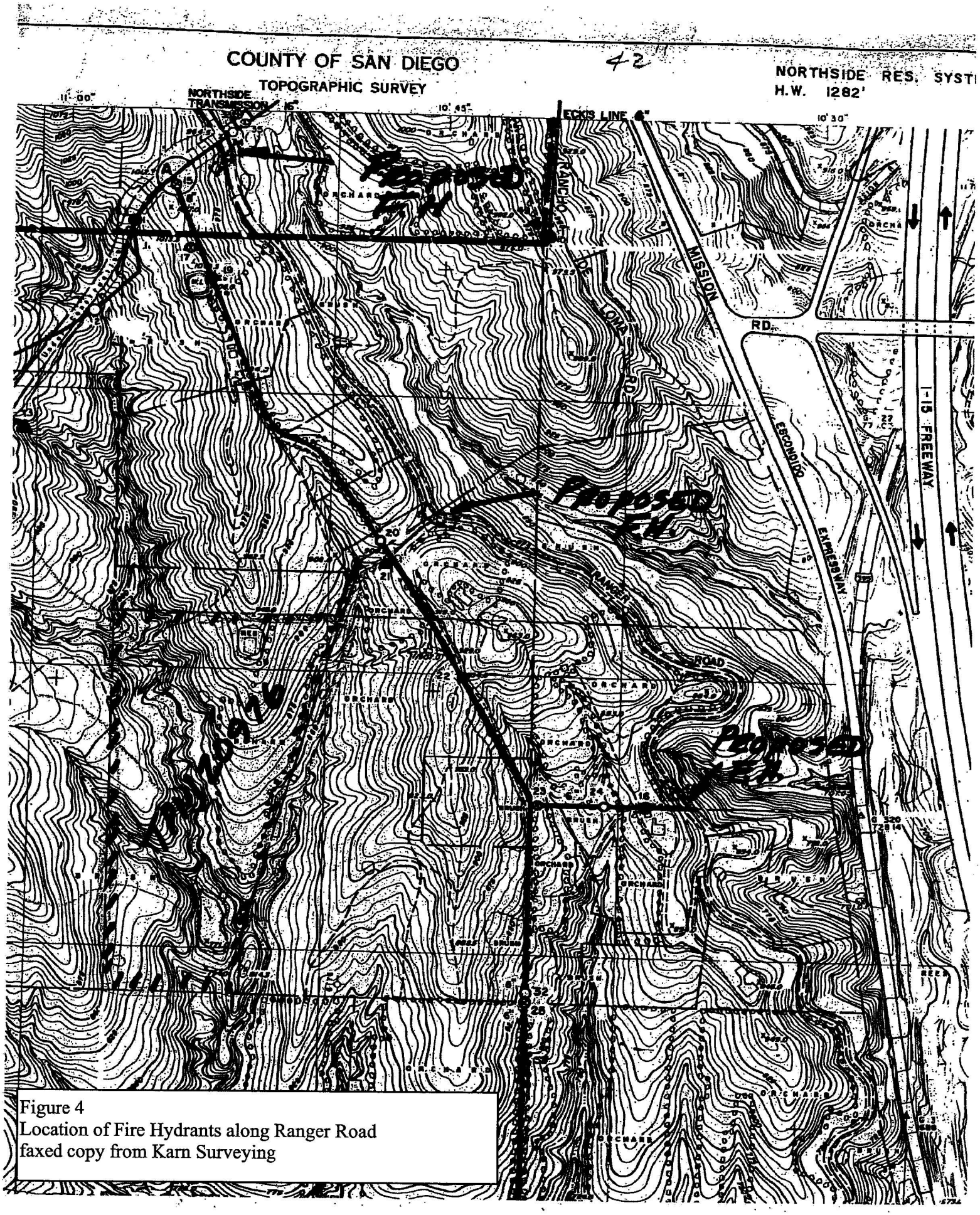


Figure 4
Location of Fire Hydrants along Ranger Road
faxed copy from Karn Surveying

by North County Fire Protection District (NCFPD) letter dated October 17, 2007 by Fire Marshal Sid Morel (Appendix A).

3.0 ACCESS AND ADDRESSES

Fire apparatus access roads are required in conformance with Section 902.2 of the County Fire Code and the November 18, 2005 letter from the North County Fire Protection District identifying fire agency recommendations. The fire apparatus access road(s) shall meet the requirements of the County of San Diego Road standards and the North County Fire Protection District specifications. As indicated on the preliminary grading plan (map pocket), the project meets the access requirements by providing:

1. 24' (feet) wide access road terminating in a 36' radius cul-de-sac.
2. 16'(feet) wide driveways
3. Fire department turnarounds at the terminus of any driveways greater that 150' (feet)
4. Driveways over 200' long shall have an approved turnout every 200'

Additionally, grades on roadways and driveways onsite do not exceed 20% and shall be improved with 3" asphaltic concrete. A residential driveway constructed of 3½" Portland cement concrete shall be installed on any slope up to 20% provided slopes over 15% have a deep broom finish perpendicular to the direction of travel to enhance traction. In addition, any barriers placed across the access road shall conform to the NCFDP standards for electric gates.

3.1 Secondary Access

According to San Diego County Fire Code, secondary access is recommended when the maximum length of a dead-end road onsite exceeds 1,320 feet for parcels zoned for 1 to 4.99 acres. The dead-end road onsite is 1,528 feet in addition to proposed driveway lengths. The project does not meet the allowable dead-end length; therefore, secondary access or mitigation measures providing the same practical effect are required.

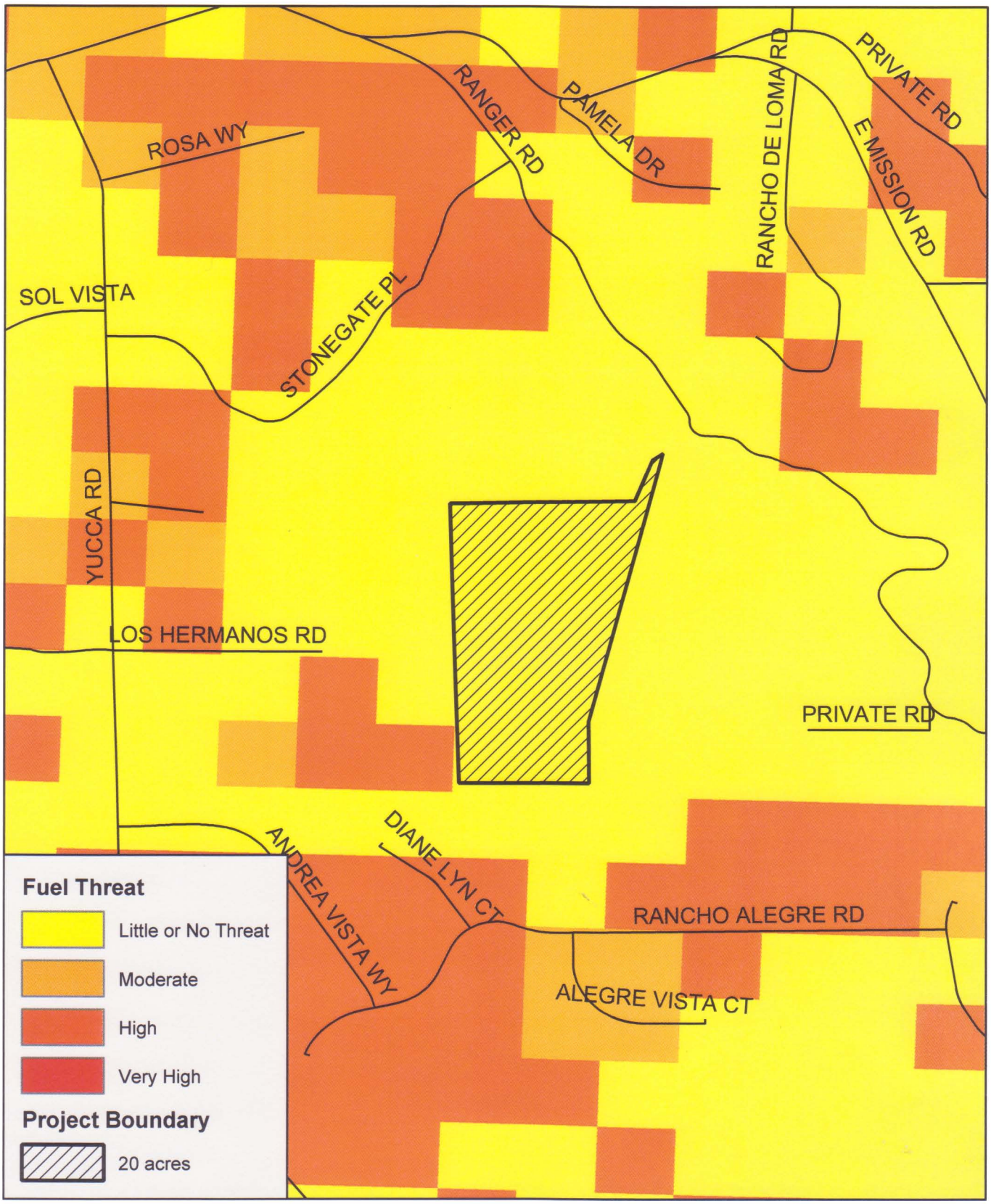
Mitigation measures being provided for lack of secondary access include the installation of three fire hydrants onsite. The hydrants are proposed onsite prior to the radius of the cul-de-sac and approximately every 500 feet along the access road. One existing fire hydrant is located near the northeast corner of the project site. Additionally, three fire hydrants shall be installed along Ranger Road. The three hydrants shall be located at at the intersection of Ranger Road and the to-be-named access road and approximately 1500 feet intervals where the waterline touches Ranger Road (Figure 4). Furthermore, Zone A fire clearing shall be extended to 50 feet on all parcels except for where impacts would occur off-site. Zone C shall provide an additional level of fire clearing within the remainder of the orchards onsite except for where impacts would occur to wetland open-space. Additionally, existing structures shall be retrofitted with residential fire sprinklers and shall meet the County's "Basic" fire resistive requirements. Proposed structures shall

meet the County's "Enhanced" fire resistive construction. Turnouts shall be provided every 200' on driveways greater than 200' to provide additional mitigation for lack of secondary access. The additional fire hydrants, enhanced fuel management zones, fire truck turnouts, required fire sprinklers, and fire resistive construction would be acceptable as reasonable means to mitigate for the lack of secondary access, therefore secondary access is not required. These conditions have been approved by the North County Fire Protection District (NCFPD) letter dated October 17, 2007 by Fire Marshal Sid Morel (Appendix A).

4.0 FIRE RESISTANCE AND FIRE PROTECTION SYSTEMS

The County of San Diego or North County Fire Protection District may require enhanced fire-resistive construction when allowing the fuel modification zone to be less than 100' (feet) in width from the structure, or when the development is located above a slope that will influence fire behavior and with dense chaparral or highly combustible trees. The site is located in an area of little to no fuel threat as mapped by the California Department of Forestry and Fire Protection (CDF) except for a small area to the southwest of the site which has a high fuel threat (Figure 5). The site is surrounded by rural development within tracts of citrus orchards (Figures 6). A site visit was conducted on June 27, 2006 by Associate Biologist, Amanda Gabrielson, to ground truth existing habitats. The biological resources map prepared by Tierra Environmental shows the habitats onsite and surrounding habitats which were used to evaluate current fuel threat conditions (Figure 7). The project is surrounded primarily by rural development within tracts of citrus orchards. Pockets of native vegetation occur within and adjacent to the project site. Although mapped in a low fuel threat area, it is recommended that the project use enhanced fire-resistive construction in conformance with the County Fire Code and the Building Code for all proposed structures. Existing structures shall meet the County's "Basic" fire resistive requirements. Residential fire sprinkler systems are required for interior protection of all proposed and existing structures in accordance with the specifications of the National Fire Protection Association Standard 13D, to the satisfaction of the North County Fire Protection District. This condition must be complied with prior to the issuance of the certificate of occupancy for each parcel so designated.

The area to the southwest is mapped by CDF as a high fuel threat, although the area is composed of non-native grassland and rural development and does not pose a higher fuel threat than the surrounding land uses. Fire modeling was performed using BehavePlus 3.0 utilizing criteria recommended by the North County Fire Protection District for Santa Ana wind conditions and high pressure subsidence conditions. The results of the modeling are summarized here and included in Appendix B. Fuel model 2 was run to represent the citrus groves found onsite. Flame lengths ranged from 2.3 feet for high pressure conditions to 28.8 feet for Santa Ana conditions.



Source: http://frap.cdf.ca.gov/

Figure 5
Fire Threat Map
Dien Do Property

N

Feet
0 400 800

Project Boundary

Figure 6
Surrounding Land Use
Dien Do Property

No scale

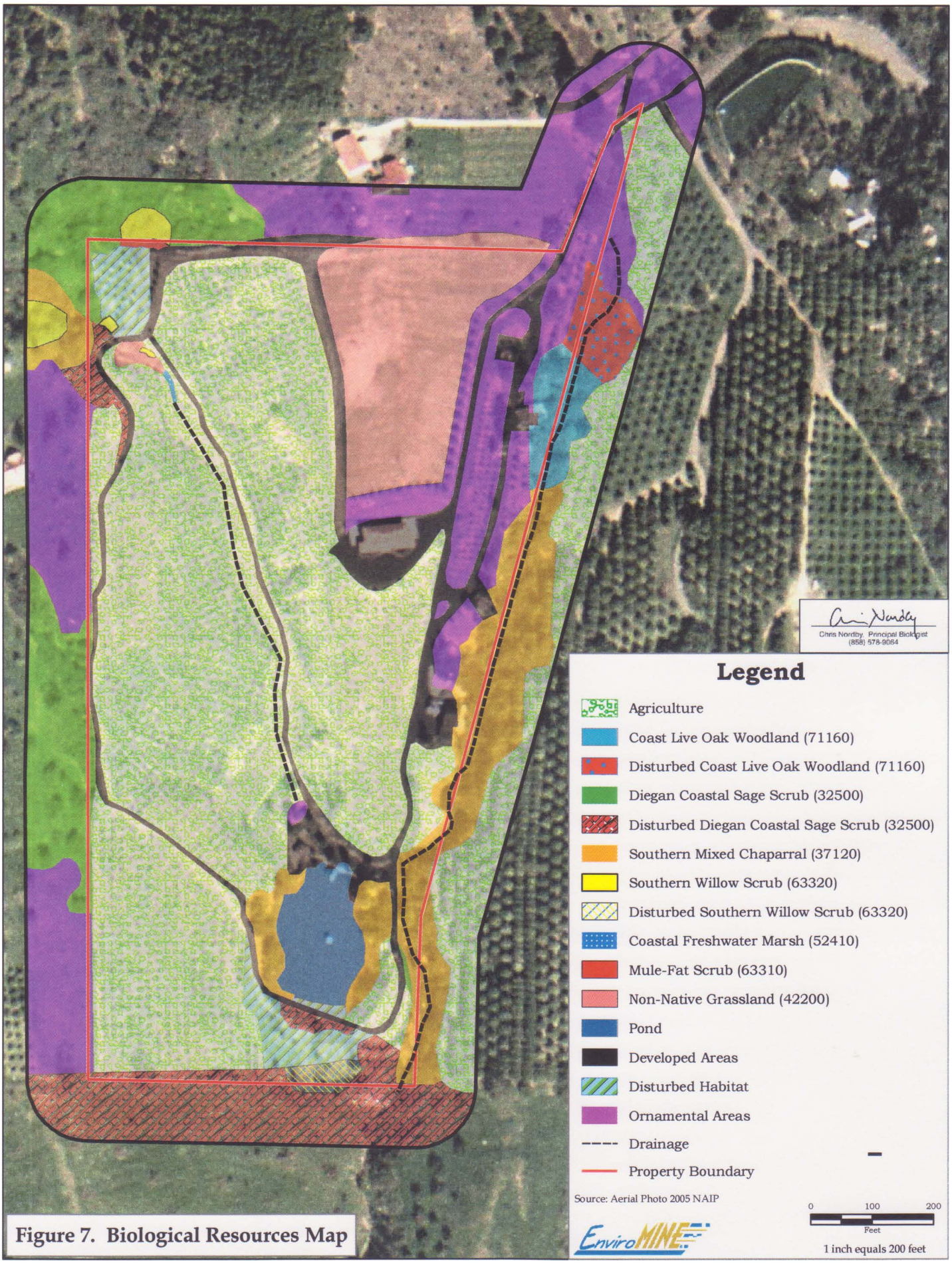
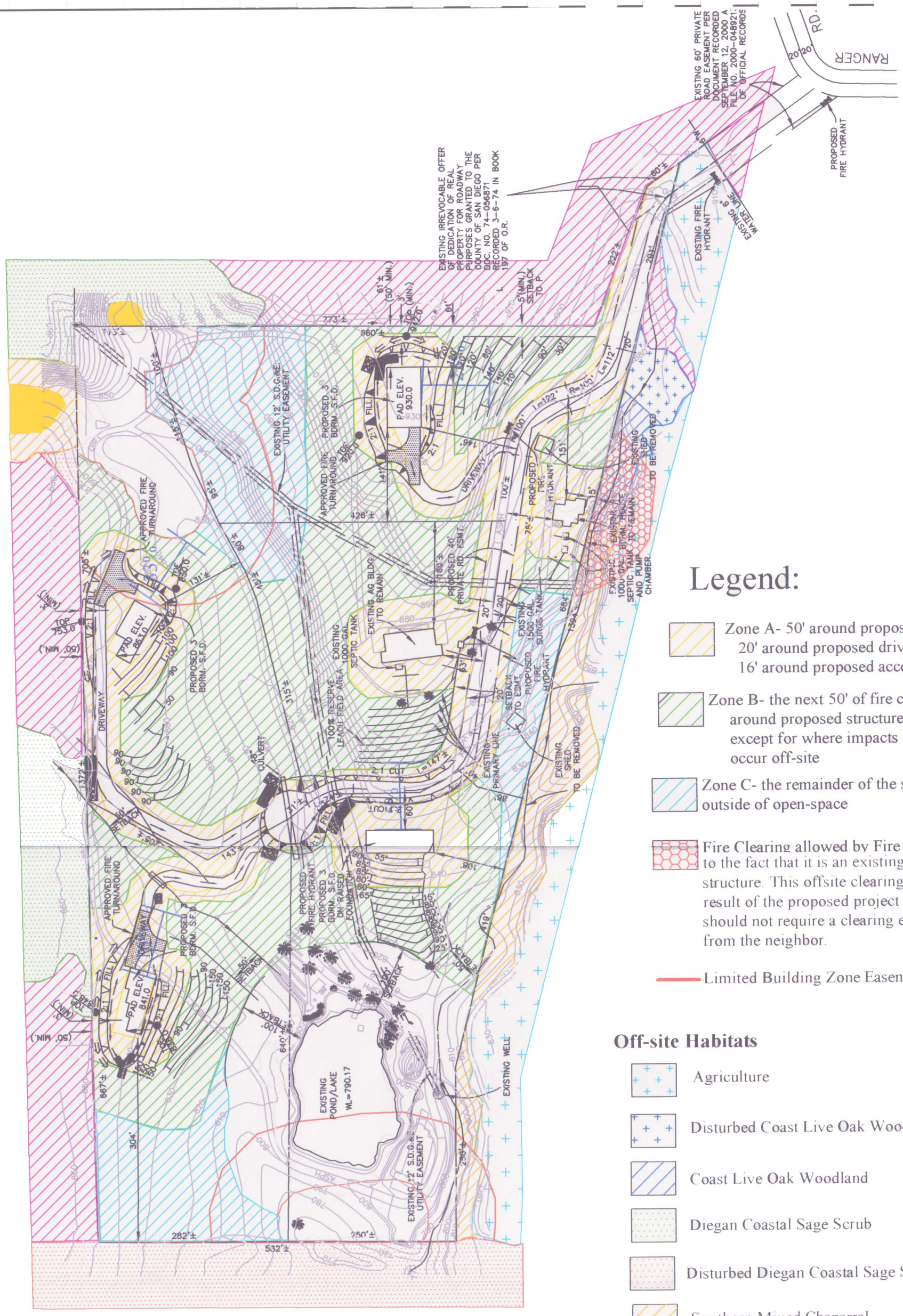


Figure 7. Biological Resources Map



Legend:

- Zone A- 50' around proposed pads 20' around proposed driveways 16' around proposed access road
- Zone B- the next 50' of fire clearing around proposed structures except for where impacts would occur off-site
- Zone C- the remainder of the site outside of open-space
- Fire Clearing allowed by Fire Code due to the fact that it is an existing structure. This offsite clearing is not a result of the proposed project and should not require a clearing easement from the neighbor.
- Limited Building Zone Easement - 100'

Off-site Habitats

- Agriculture
- Disturbed Coast Live Oak Woodland
- Coast Live Oak Woodland
- Diegan Coastal Sage Scrub
- Disturbed Diegan Coastal Sage Scrub
- Southern Mixed Chaparral
- Southern Willow Scrub
- Ornamental Areas

NORTH

Scale 1"=150'

RC Biological Consulting, Inc.	**Fuel Management Zones** **Do Minor Subdivision -TPM 20976** **September 2008**	**Figure 8**

The proposed fuel management zone is a minimum of 100' around proposed pads except for where impacts would extend off-site. The fuel management zone is 30' (feet) around pads where the pad is adjacent to existing maintained ornamental landscaping off-site. The proposed fuel management zone shall be 16' along each side of the proposed access road and 20' along each side of proposed driveways. Fuel modification zones are depicted in Figure 8.

5.0 BRUSH MANAGEMENT

Several factors were taken into consideration when determining the brush zone including topography, degree of exposure, lot size, and proximity to natural land. The site is composed of orchards and surrounded primarily by rural development and groves. The project is technically located within the urban-wildland interface, however the surrounding sites consist of developed lands and/or lands that will be maintained in the future. The fuel management zone is divided into Zones A, B, and C which are depicted in Figure 8 and shall be maintained as describe below. There is an existing 1 bedroom house that is proposed to remain. This house is approximately 15 feet from the western property line. This is an existing condition to which the current Fire Code would mandate 100 feet of fire clearing even though it extends offsite. Since this is an existing condition and not a new condition as a result of the proposed project the project should not be required to obtain a clearing easement from the adjacent property owner. This is a situation where "forced abatement" would apply if the adjacent property owner were not maintaining the balance of the 100 feet from the structure or allowing the maintenance of that area. The area of pre-existing offsite fire clearing has been depicted of Figure 8.

Zone A

The purpose of the Zone A is to provide a defensible space for fire suppression forces and to protect structures from radiant and convective heat. The fuel management zone is 50' around pads/ proposed structures where the pad/structure is adjacent to existing maintained ornamentals. A 50 foot limited building zone easement has been place along the western property line to ensure that the proposed structures on the pads will not be placed any closer then 50 feet to the property line. Zone A shall be 16' along each side of the proposed access road and 20' along each side of proposed driveways. The land use adjacent to these areas is composed of maintained ornamental landscaping. According to the North County Fire Protection District Policy and Procedure Manual, the following measures are required and will reduce fire hazards near buildings:

- Minimum 30' (feet) side and rear yard setbacks.
- Plants will only be selected from the County of San Diego "Acceptable Plants for a Defensible Space in Fire Prone Areas" included as Appendix C or other as approved by the Fire marshal.

- No combustible construction, groves, firewood, propane tanks, fuel, or other combustible native or ornamental vegetation shall be allowed within Zone A or within 30' of slopes. A list of undesirable plants is included in Appendix D.
- Mature trees (>18') to be limbed up 6' from ground and spaced on 40' centers.
- No tree limbs within 10' of chimney outlets or dead limbs overhanging structures.
- Plant spacing as follows:
    a. Slopes 0-20%---2 times height of mature plant
    b. Slopes 21-40%---4 times height of mature plant
    c. Slopes >40%--- 6 times height of mature plant.

Irrigation

Permanent irrigation shall be provided to ornamental plantings. Irrigation will conform to any applicable County Landscape Requirements.

Maintenance

Maintenance within this zone shall be performed year-round and include the following tasks:

- Prune and thin trees (Figures 9 and 10) around structures to decrease fuel volume, retain succulent growth and to provide adequate clearance between structures and plants.
- Tree branches overhanging roofs shall be removed.
- Trash and combustible debris shall be cleared from around structures, and removed from roofs and rain gutters.
- Irrigation systems shall be maintained to ensure that they function properly and plantings are watered sufficiently to maintain succulent growth.

Thinning and Pruning

Figure 9, below illustrates how native trees retained and planted trees shall have a minimum canopy separation of 40 feet.

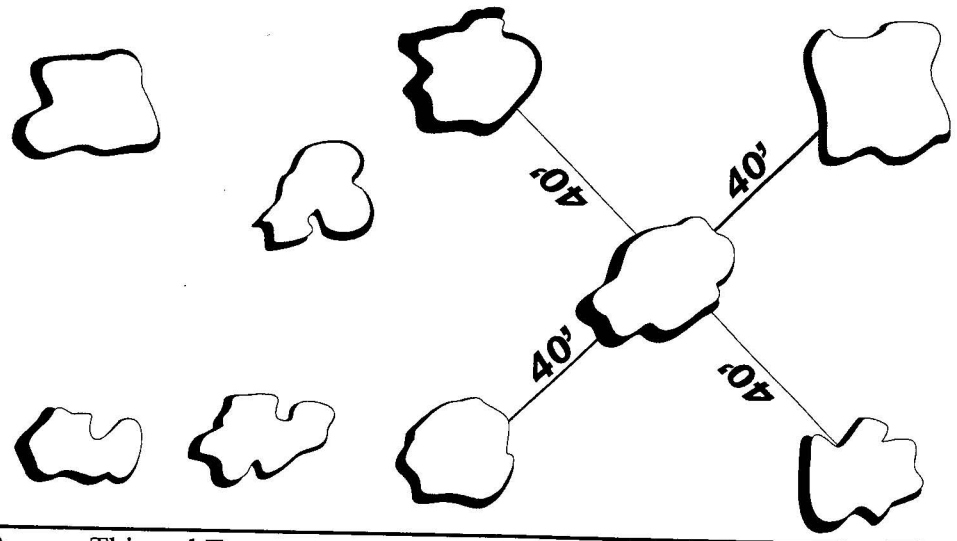


Figure 9. Thinned Trees

Pruning will further reduce the fuel load. Pruning shall be accomplished in the following manner:

- Individual trees and shrubs will be pruned to remove dead, dying and excessively twiggy growth. Figure 10, below illustrates the desired result of pruning.

Unpruned Shrub

Pruned Shrub

Figure 10. Pruning of Landscape Shrubs and Retained Trees

- Trees and larger tree form shrubs shall be pruned to provide clearance of three times the height of the understory plant material or six feet whichever is higher. Figure 11, below illustrates this requirement.

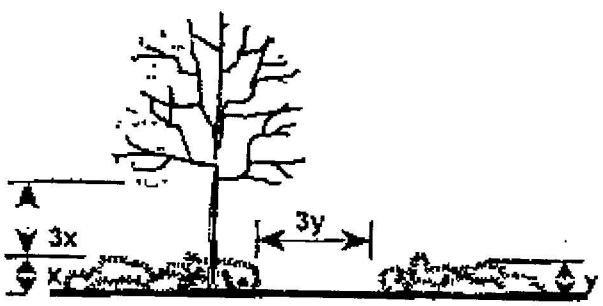


Figure 11. Pruning Trees and Tree Form Shrubs for Brush Management

Zone B

Zone B is an additional 50' adjacent to Zone A except for where impacts would occur offsite. Zone B is depicted in Figure 8. This section shall be irrigated and all dead or dying trees shall be removed. Additionally, the project will conform to the North County Fire Protection District Policy and Procedure Manual by implementing the following measures to reduce fire hazards:

- Existing groves may exist within this area but a 50% clearing is required.
- Trees or new groves to be maintained as noted for Zone A and spaced as follows:
  a. Slopes 0-20%---40' centers
  b. Slopes 21-40%---60' centers
  c. Slopes >40%---90' centers
- Tree litter (duff) may remain under groves up to 6 inches in depth.
- Fire resistive plant materials are also required in Zone B to control soil erosion and/or to reduce vegetation mass near the development/wildland interface. A list of "Acceptable Plants for a Defensible Space in Fire Prone Areas" can be found in Appendix C.
- Plant spacing same as noted for Zone A.

Zone C

Zone C is the remainder of the property onsite outside of wetland open space. This zone serves as an additional level of fuel management to mitigate for the lack of secondary access. Zone C shall be maintained by removing all dead or downed fuel from the remaining orchards onsite.

6.0 RESPONSIBILITIES

The following section identifies the responsible parties for conformance and implementation of this plan.

Conformance

The ultimate responsibility for conformance with the fire protection plan lies with the landowner as identified on the County Tax Assessor records.

Conformance Approval

Conformance approval is under the jurisdiction of the North County Fire Marshal.

APPENDIX A

NORTH COUNTRY FIRE PROTECTION DISTRICT LETTERS

315 East Ivy Street · Fallbrook, California 92028-2138 · (760) 723-2005 · Fax (760) 723-2004 · www.ncfire.org

December 6, 2007

County of San Diego
Dept. of Planning & Land Use
5201 Ruffin Rd. Ste. B
San Diego, CA 92123-1666

Re: TPM 20976

This project has an approved fire protection plan that mitigates for secondary access.

This project requires secondary access. The Mitigation factors that are proposed will meet the "Same practical effect" as secondary access.

The applicant shall install 3 residential fire hydrants along Ranger Road. This agency feels that this proposal is a piece of the overall conditions needed to mitigate for secondary access. The following conditions are also proposed as a condition of the project in order to meet the "same practical effect" of secondary access.

1) All structures shall be built to meet the Counties "Enhanced" fire resistive construction requirements.
2) The existing structures that are to remain shall meet the Counties "basic" fire resistive requirements.
3) Any existing residential structure that remains shall be retrofitted with residential fire sprinklers.
4) Install two more hydrants along the access road approximately every 500 feet. Install all hydrants on the North side of the access road.
5) Increase zone "A" from 30 feet to 50 feet and include the existing structures.
6) The approved fire department turnarounds fit on the conceptual pad.
7) Driveways over 200 feet long shall require an approved turnout every 200 feet.

Access:

- To be named access road to be 24' AC surface width.
- Maximum inside turning radius of all access roads and driveways to be 28' minimum.
- Provide a 36' AC radius cul de sac at terminus of access road.
- Driveways to be 16' AC surface width with an approved fire dept. turnaround at terminus of all driveways greater than 150'.
- Grades on driveway or roadway not to exceed 20%.
- Grades on driveways and access road over 15% shall have 3 ½ inches of Portland Cement

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concrete installed with a deep broom finish perpendicular to the direction of travel to enhance traction.

- Provide street sign for to be named access road in accordance with DS-13.
- Any barriers placed across access road must conform to NCFPD standards for electric gates

Water Supply: Provide five (5) residential type fire hydrants, with drip caps and blue dot markers, capable of supplying 1500 GPM, with 2500 GPM available in the mains, to NCFPD and RMWD standards, in the following locations:

- Intersection of to be named access road and Ranger Rd.
- Prior to radius of cul de sac.
- As proposed along Ranger Road by Karn Surveying.

Other: Road and driveway improvements to be installed prior to bring combustibles on site.

Should you have any questions, please contact me at (760) – 723- 2015.

Sincerely,

Sid Morel
Fire Marshal

NORTH COUNTY FIRE PROTECTION DISTRICT

315 East Ivy Street · Fallbrook, California 92028-2138 · (760) 723-2005 · Fax (760) 723-2004 · www.ncfire.org

October 17, 2007

Hadley Johnson
William Karn Surveying, INC.
129 W. Fig Street
Fallbrook, Ca. 92028

Re: Fire Protection Plan, TPM 20976 Revised September 2007

The revised Fire Protection Plan is approved.

This project requires secondary access. The Mitigation factors that are proposed will meet the "Same practical effect" as secondary access.

The applicant shall install 3 residential fire hydrants along Ranger Road. This agency feels that this proposal is a piece of the overall conditions needed to mitigate for secondary access. The following conditions are also proposed as a condition of the project in order to meet the "same practical effect" of secondary access.

1) All structures shall be built to meet the Counties "Enhanced" fire resistive construction requirements.
2) The existing structures that are to remain shall meet the Counties "basic" fire resistive requirements.
3) Any existing residential structure that remains shall be retrofitted with residential fire sprinklers.
4) Install two more hydrants along the access road approximately every 500 feet. Install all hydrants on the North side of the access road.
5) Increase zone "A" from 30 feet to 50 feet and include the existing structures.
6) The approved fire department turnarounds fit on the conceptual pad.
7) Driveways over 200 feet long shall require an approved turnout every 200 feet.

These revised fire protection plan is approved based on the proposed mitigating factors.

Sincerely,

Sid Morel
Fire Marshal

NORTH COUNTY FIRE PROTECTION DISTRICT

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August 1, 2007

Hadley Johnson
William Karn Surveying, INC.
129 W. Fig Street
Fallbrook, Ca. 92028

Re: Fire Protection Plan, TPM 20976 RPL

The revised Fire Protection Plan is not approved.

This project requires secondary access. The North County Fire Protection District feels secondary access could be mitigated by meeting the following conditions:

The applicant proposes to install 3 residential fire hydrants along Ranger Road. This agency feels that this proposal is a piece of the overall conditions needed to mitigate for secondary access. The following conditions will also need to be a condition of the project in order to meet the "same practical effect" of secondary access.

1) All structures shall be built to meet the Counties "Enhanced" fire resistive construction requirements.
2) The existing structures that are to remain shall meet the Counties "basic" fire resistive requirements.
3) Any existing residential structure that remains shall be retrofitted with residential fire sprinklers.
4) Install two more hydrants along the access road approximately every 500 feet. Install all hydrants on the North side of the access road.
5) Increase zone "A" from 30 feet to 50 feet and include the existing structures.
6) It does not appear that the approved fire department turnarounds fit on the conceptual pad.
7) Driveways over 200 feet long shall require an approved turnout every 200 feet.

Please revise the fire protection plan to include these additional items needed to meet the "same practical effect" as secondary access or provide secondary access.

Sincerely,

Sid Morel
Fire Marshal

NORTH COUNTY FIRE PROTECTION DISTRICT

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December 22, 2006

County of San Diego
Dept. of Planning & Land Use
5201 Ruffin Rd. Ste. B
San Diego, CA 92123-1666

Re: TPM 20976 RPL 2(APN 108-081-06)

Without submittal of a detailed plot plan, which clearly shows building pads, setbacks to open space and native vegetation, and proposed access, this agency cannot provide more specific requirements. Please review the following comments pertaining to fire protection for this proposed development:

Access:

- To be named access road to be 24' AC surface width.
- Maximum inside turning radius of all access roads and driveways to be 28' minimum.
- Provide a 36' AC radius cul de sac at terminus of access road.
- Driveways to be 16' AC surface width with an approved fire dept. turnaround at terminus of all driveways greater than 150'.
- Grades on driveway or roadway not to exceed 20%.
- Grades on driveways and access road over 15% shall have 3 ½ inches of Portland Cement concrete installed with a deep broom finish perpendicular to the direction of travel to enhance traction. **Please change the paragraph on page 5 of the Fire Protection Plan from may have concrete to shall.**
- Provide street sign for to be named access road in accordance with DS-13.
- Any barriers placed across access road must conform to NCFPD standards for electric gates

Fire Protection Plan: The Fire Protection Plan is not approved for the following reasons:

- This project needs secondary access. This agency approves the project as designed with the addition of the following items to **mitigate the lack of secondary access.**
  1. This agency feels that a major threat to this development would be from the east during a Santa Ana worst case condition. The access road Ranger Road lacks adequate hydrants to serve this area. Install Fire Hydrants on Ranger Road. (See additional letter to Kam Surveying)
  2. In the letter received by this agency from Kam Surveying Dated November 15, 2006 The applicant proposed to install 3 Fire Hydrants along Ranger Road at approx. 1500 feet intervals, where the waterline does touch Ranger Road. This would be acceptable as a reasonable means to mitigate for the lack of secondary access.

NORTH COUNTY FIRE PROTECTION DISTRICT

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ROBERT H. JAMES – Counsel
LOREN A. STEPHEN-PORTER – Board Secretary

3. The North County Fire Protection District shall require these houses to be built with enhanced fire-resistive construction.

4. Vegetation clearing along access road shall be 16 feet on each side and 20 feet along driveways.

Water Supply: Provide five (5) residential type fire hydrants, with drip caps and blue dot markers, capable of supplying 1500 GPM, with 2500 GPM available in the mains, to NCFPD and RMWD standards, in the following locations:

- Intersection of to be named access road and Ranger Rd.
- Prior to radius of cul de sac.
- As proposed along Ranger Road by Karn Surveying.

Combustible Vegetation Clearance: Provide 100' combustible vegetation clearance around structures and 16' alongside roadway and driveways. Building setbacks from property lines and open space easements to be sufficient so as to provide 100' native vegetation clearance without going off site. Existing plan does not provide sufficient detail to determine adequacy of building setbacks from property lines.

Other: Road and driveway improvements to be installed prior to bring combustibles on site.

- Please address clearing, access and construction types of existing structures that will remain.
- **Revise the Fire Protection plan to address mitigation measures for secondary access as well as driveway requirements and proper clearing along driveways.**

Should you have any questions, please contact me at (760) – 723- 2015.

Sincerely,

Sid Morel
Fire Marshal

NORTH COUNTY FIRE PROTECTION DISTRICT

315 East Ivy Street · Fallbrook, California 92028-2138 · (760) 723-2005 · Fax (760) 723-2004 · www.ncfire.org

September 25, 2006

County of San Diego
Dept. of Planning & Land Use
5201 Ruffin Rd., Suite B
San Diego, CA 92123-1666

RE: TPM 20976 (APN 108-081-06)

Without submittal of a detailed plot plan, which clearly shows building pads, setbacks to open space and native vegetation, and proposed access, this agency cannot provide more specific requirements.

Please review the following comments pertaining to fire protection for this proposed development.

Access:

- To be named access road to be 24' AC surface width.
- Maximum inside turning radius of all access roads and driveways to be 28' minimum.
- Provide a 36' AC radius cul-de-sac at terminus of access road.
- Driveways to be 16' AC surface width with an approved fire department turnaround at terminus of all driveways greater than 150'.
- Grades on driveway or roadway not to exceed 20%.
- Grades on driveways and access road over 15% shall have 3½ inches of Portland Cement concrete installed with a deep broom finish perpendicular to the direction of travel to enhance traction.
- Provide street sign for to be named access road in accordance with DS-13.
- Any barriers placed across access road must conform to NCFPD standards for electric gates

Fire Protection Plan:

- This project needs secondary access. This agency approves the project as designed with the addition of the following items to **mitigate the lack of secondary access.**
    1. This agency feels that a major threat to this development would be from the east during a Santa Ana worst-case condition. The access road, Ranger Road, lacks adequate hydrants to serve this area. Install fire hydrants on Ranger Road starting at the intersection of East Mission, every 1,000 feet to include 1,000 feet south of the access road into this development.

2. The North County Fire Protection District shall require these houses to be built with enhanced fire-resistive construction.
3. Increase zone "A" from 30 feet to 50 feet. Zone "B" becomes 50 feet to 100 feet.
4. Vegetation clearing along access road shall be 16 feet on each side and 20 feet along driveways.

Water Supply:

- Provide two residential type fire hydrants, with drip caps and blue dot markers, capable of supplying 1500 GPM, with 2500 GPM available in the mains, to NCFPD and RMWD standards in the following locations:
  1. Intersection of to-be-named access road and Ranger Rd.
  2. Prior to radius of cul-de-sac.

Combustible Vegetation Clearance:

- Provide 100' combustible vegetation clearance around structures and 16' alongside roadway and driveways. Building setbacks from property lines and open space easements to be sufficient so as to provide 100' native vegetation clearance without going off site. Existing plan does not provide sufficient detail to determine adequacy of building setbacks from property lines.

Other:

- Road and driveway improvements to be installed

Should you have any questions, please contact me at (760) 723-2015.

Sincerely,

Sid Morel
Fire Marshal

APPENDIX B

FUEL MODELING

Fire Modeling For: DO Property in Fallbrook

Behave Version: ____________

Modeled by: AC

Parcel	Habitat	Fuel Model	Fuel Moisture	20-Ft Wind Speed MI/H	Wind Direction	Slope	Aspect	Flame Length (Ft)	Direction of Max Spread	Towards Structure (y/n)
1	citrus ~~AVO~~ orchards	2			NW	33	225	32.1	w/model 8 = 2.3 28°	0 sA. 12 - HP.
2	"	"			W	25	270	32.2		
3	"	"			N	5	180	32.2		
4	"	"			NW	16	225	32.2	w model 8 = 2.3	

Closed timber litter (model 8)

Timber w/ grass & understory (model 2)

Modules: SURFACE, SCORCH

Description: North County Santa Ana - Citrus Groves

Fuel/Vegetation, Surface/Understory

Fuel Model		2

Fuel Moisture

Dead Fuel Moisture	%	3
Live Fuel Moisture	%	60

Weather

20-ft Wind Speed	mi/h	60
Wind Adjustment Factor		0.4
Wind Direction (from north)	deg	45
Air Temperature	oF	80

Terrain

Slope Steepness	%	33
Aspect (from north)	deg	225

Run Option Notes

Calculations are only for the direction of maximum spread [SURFACE].

Fireline intensity, flame length, and spread distance are always for the direction of the spread calculations [SURFACE].

Wind and spread directions are degrees clockwise from north [SURFACE].

Wind direction is the direction from which the wind is blowing [SURFACE].

Output Variables

Surface Rate of Spread (maximum) (ch/h) [SURFACE]

Flame Length (ft) [SURFACE]

Direction of Maximum Spread (from north) (deg) [SURFACE]

Midflame Wind Speed (mi/h) [SURFACE]

Wind Adjustment Factor [SURFACE]

Wind/Slope/Spread Direction Diagram [SURFACE]

Fire Characteristics Chart [SURFACE]

Scorch Height (ft) [SCORCH]

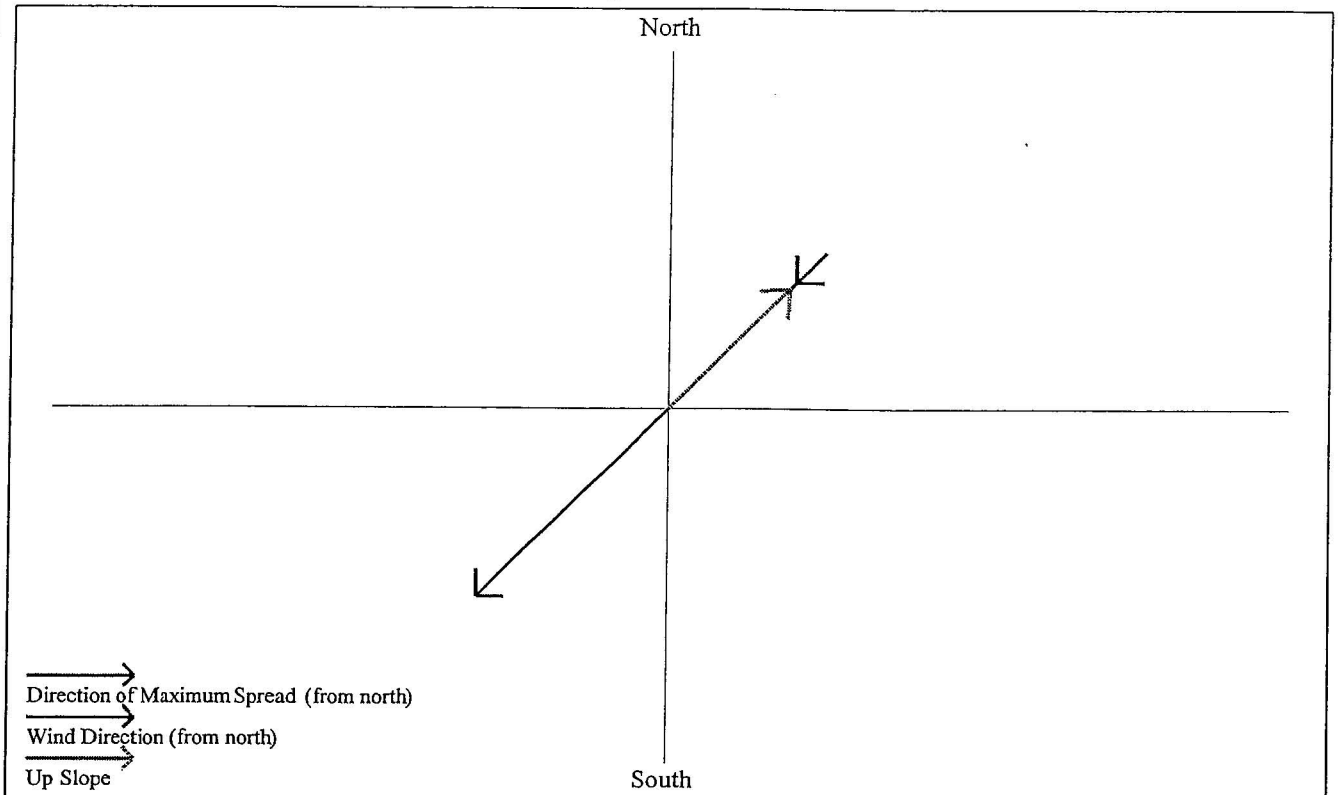
(continued on next page)

North County Santa Ana - Citrus Groves

Surface Rate of Spread (maximum)	829.0	ch/h
Flame Length	28.8	ft
Direction of Maximum Spread (from north)	225	deg
Midflame Wind Speed	24.0	mi/h
Wind Adjustment Factor	0.4	
Scorch Height	269	ft

North County Santa Ana - Citrus Groves

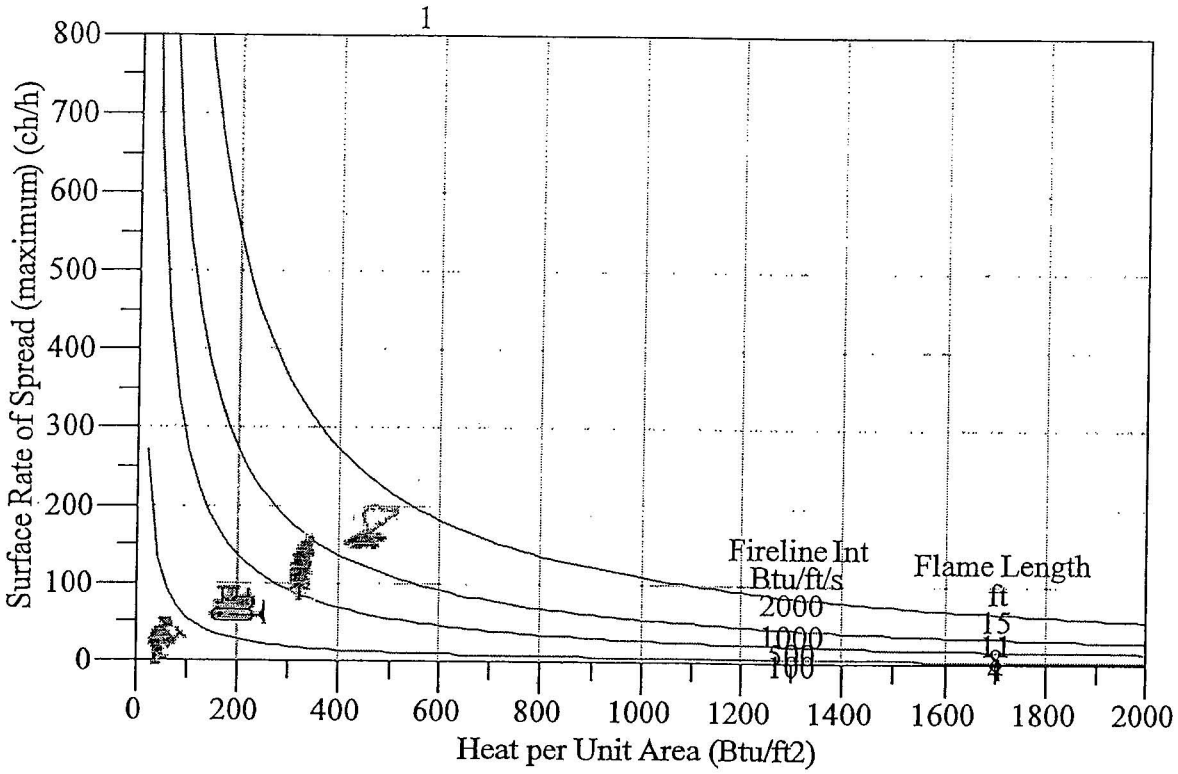
Wind / Slope / Fire Directions



Direction of Maximum Spread (from north) 225 deg

North County Santa Ana - Citrus Groves

Fire Characteristics Chart



Discrete Variable Codes Used
North County Santa Ana - Citrus Groves

Fuel Model

2	Timber with grass and understory (S)

Modules: SURFACE, SCORCH

Description: North County High Pressure - Citrus Groves

Fuel/Vegetation, Surface/Understory

Fuel Model		2

Fuel Moisture

Dead Fuel Moisture	%	3
Live Fuel Moisture	%	60

Weather

20-ft Wind Speed	mi/h	20
Wind Adjustment Factor		0.4
Wind Direction (from north)	deg	225
Air Temperature	oF	100

Terrain

Slope Steepness	%	33
Aspect (from north)	deg	225

Run Option Notes

Calculations are only for the direction of maximum spread [SURFACE].

Fireline intensity, flame length, and spread distance are always for the direction of the spread calculations [SURFACE].

Wind and spread directions are degrees clockwise from north [SURFACE].

Wind direction is the direction from which the wind is blowing [SURFACE].

Output Variables

Surface Rate of Spread (maximum) (ch/h) [SURFACE]

Flame Length (ft) [SURFACE]

Direction of Maximum Spread (from north) (deg) [SURFACE]

Midflame Wind Speed (mi/h) [SURFACE]

Wind Adjustment Factor [SURFACE]

Wind/Slope/Spread Direction Diagram [SURFACE]

Fire Characteristics Chart [SURFACE]

Scorch Height (ft) [SCORCH]

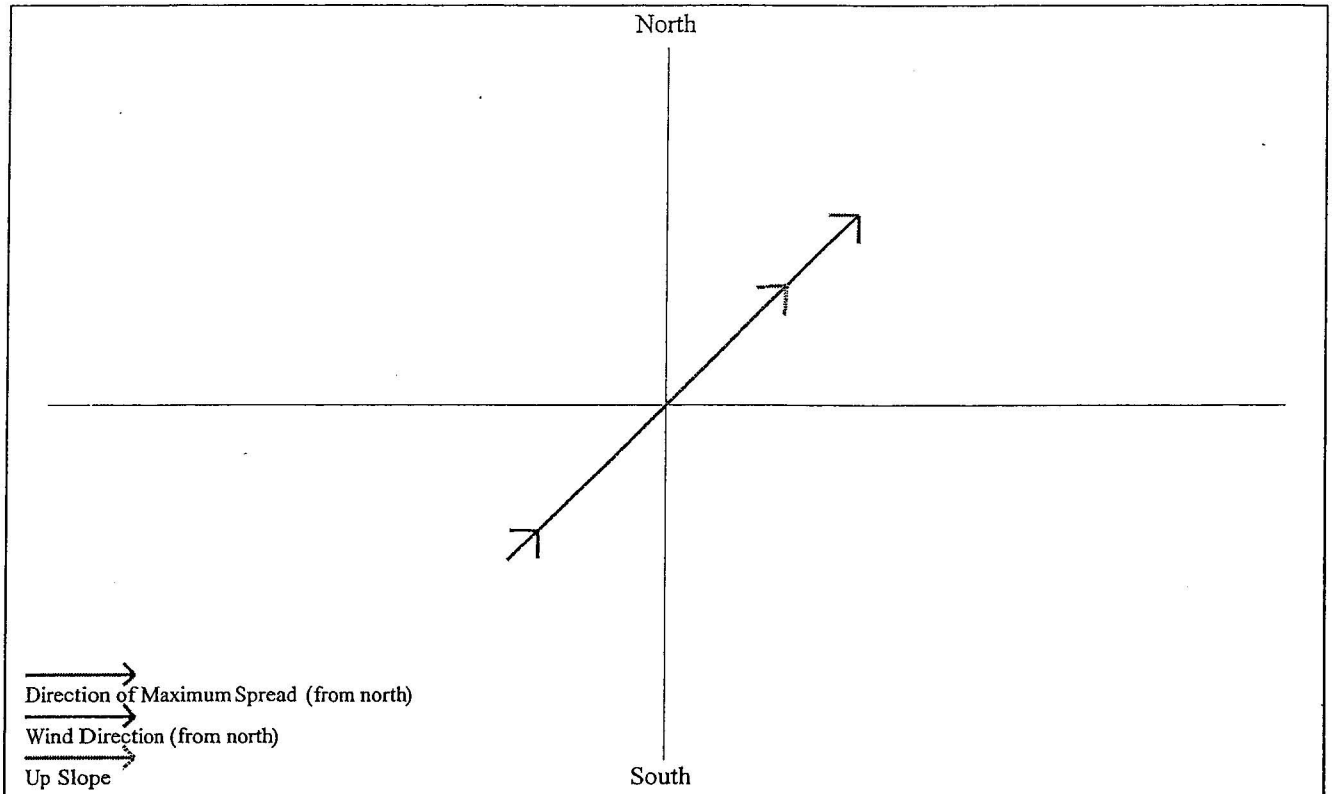
(continued on next page)

North County High Pressure - Citrus Groves

Surface Rate of Spread (maximum)	123.6	ch/h
Flame Length	12.0	ft
Direction of Maximum Spread (from north)	45	deg
Midflame Wind Speed	8.0	mi/h
Wind Adjustment Factor	0.4	
Scorch Height	155	ft

North County High Pressure - Citrus Groves

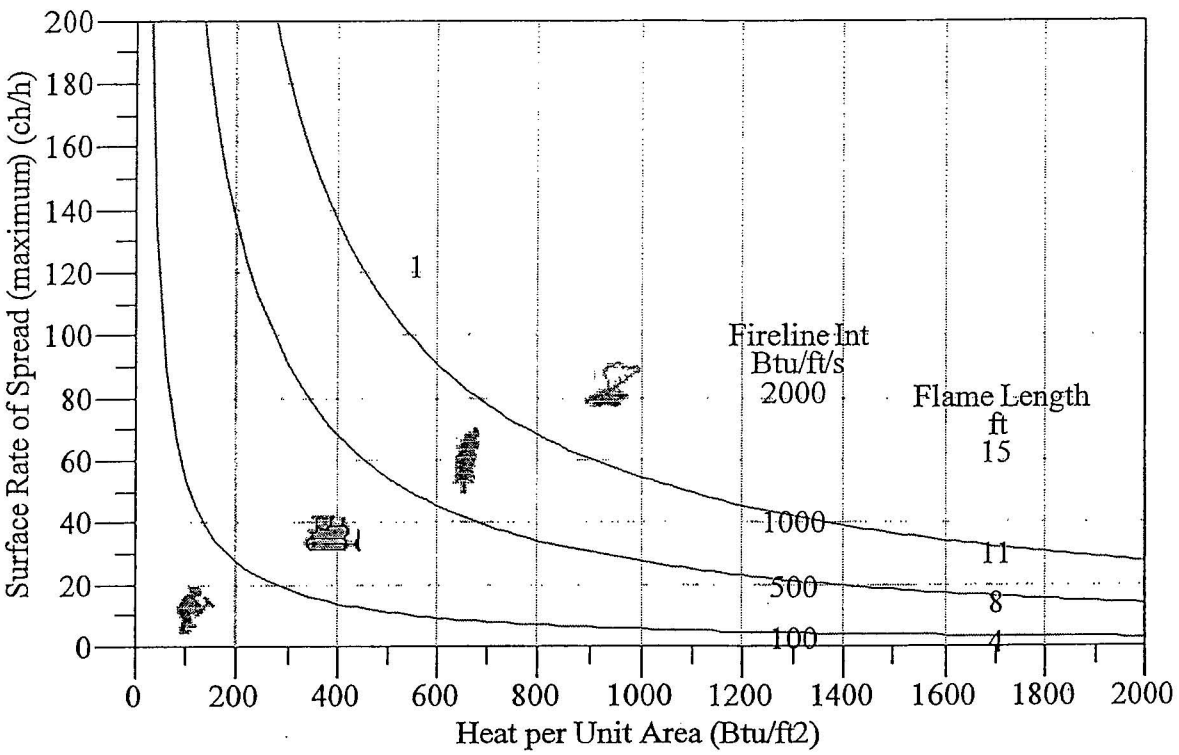
Wind / Slope / Fire Directions



Direction of Maximum Spread (from north) 45 deg

North County High Pressure - Citrus Groves

Fire Characteristics Chart



Discrete Variable Codes Used
North County High Pressure - Citrus Groves

Fuel Model

2	Timber with grass and understory (S)

APPENDIX C

SUGGESTED PLANT LIST FOR A DEFENSIBLE SPACE

SUGGESTED PLANT LIST FOR A DEFENSIBLE SPACE

BOTANICAL NAME	COMMON NAME	Climate Zone
TREES		
Acer		
platanoides	Norway Maple	M
rubrum	Red Maple	M
saccharinum	Silver Maple	M
saccarum	Sugar Maple	M
macrophyllum	Big Leaf Maple	C/ (R)
Alnus rhombifolia	White Alder	C/I/M (R)
Arbutus		
unedo	Strawberry Tree	All zones
Archontophoenix		
cunninghamiana	King Palm	C
Arctostaphylos spp.**	Manzanita	C/I/D
Brahea		
armata	Blue Hesper Palm	C/D
edulis	Guadalupe Palm	C/D
Ceratonia siliqua	Carob	C/I/D
Cerdidium floridum	Blue Palo Verde	D
Cercis occidentalis**	Western Redbud	C/I/M
Cornus		
nuttallii	Mountain Dogwood	I/M
stolonifera	Redtwig Dogwood	I/M
Eriobotrya		C/I/D
japonica	Loquat	C
Erythrina caffra	Kaffirboom Coral Tree	I/M
Gingko biloba "Fairmount"	Fairmount Maidenhair Tree	I/D/M
Gleditisia triacanthos	Honey Locust	
Juglans		I
californica	California Walnut	C/I
hindsii	California Black Walnut	I/D/M
Lagerstroemia indica	Crape Myrtle	I
Ligustrum lucidum	Glossy Privet	C/I/M
Liquidambar styraciflua	Sweet Gum	I
Liriodendron tulipifera	Tulip Tree	
Lyonothamnus floribundus		C
ssp. Asplenifolius	Fernleaf Catalina Ironwood	C/I/D
Melaleuca spp.	Melaleuca	C/I
Parkinsonia aculeate	Mexican Palo Verde	
Pistacia	Chinese Pistache	
chinensis	Pistachio Nut	C/I/D

vera	Pistachio Nut	I
Pittosporum		
phillyraeoides	Willow Pittosporum	C/I/D
viridiflorum	Cape Pittosporum	C/I
Platanus		
acerifolia	London Plane Tree	All zones
racemosa**	California Sycamore	C/I/M
Populus		
alba	White Poplar	D/M
fremontii**	Western Cottonwood	I
trichocarpa	Black Cottonwood	I/M
Prunus		
xblireiana	Flowering Plum	M
caroliniana	Carolina Laurel Cherry	C
ilicifolia**	Hollyleaf Cherry	C
lyonii**	Catalina Cherry	C
serrulata 'Kwanzan'	Flowering Cherry	M
yedoensis 'Akebono'	Akebono Flowering Cherry	M
Quercus		
agrifolia**	Coast Live Oak	C/I
engelmannii	Engelmann Oak	I
** suber	Cork Oak	C/I/D
Rhus		
lancea**	African Sumac	C/I/D
Salix spp.**	Willow	All zones (R)
Tristania conferta	Brisbane Box	C/I
Ulmus		
parvifolia	Chinese Elm	I/D
pumila	Siberian Elm	C/M
Umbellularia californica**	California Bay Laurel	C/I

SHRUBS		
Agave	Century Plant	D
americana	Century Plant	D
deserti	Shawis Century Plant	D
shawi**		
Amorpha fruticosa**	False Indigobush	I
Arbutus		
menziesii**	Madrone	C/I
Arctostaphylos spp.**	Manzanita	C/I/D
Atriplex**		
canescens	Hoary Saltbush	I
lentiformis	Quail Saltbush	D
Baccharis**		
glutinosa	Mule Fat	C/I
pilularis	Coyote Bush	C/I/D
Carissa grandiflora	Natal Plum	C/I
Ceanothus spp.**	California Lilac	C/I/M
Cistus spp.	Rockrose	C/I/D
Cneoridium dumosum**	Bushrue	C
Comarostaphylis**		
diversifolia	Summer Holly	C
Convolvulus cneorum	Bush Morning Glory	C/I/M
Dalea		
orcuttii	Orcutt's Delea	D
spinosa**	Smoke Tree	I/D
Elaeagnus		
pungens	Silverberry	C/I/M
Encelia**		
californica	Coast Sunflower	C/I
farinose	White Brittlebush	D/I
Eriobotrya		
deflexa	Bronze Loquat	C/I
Eriophyllum		
confertiflorum**	Golden Yarrow	C/I
staechadifolium	Lizard Tail	C
Escallonia spp.	Escallonia	C/I
Feijoa sellowiana	Pineapple Guava	C/I/D
Fouqueria splendens	Ocotillo	D
Fremontodendron**		
californicum	Flannelbush	I/M
mexicanum	Southern Flannelbush	I
Galvezia		
juncea	Baja Bush-Snapdragon	C
speciosa	Island Bush-Snapdragon	C
Garrya		
elliptica	Coast Silktassel	C/I
flavescens**	Ashy Silktassel	I/M

Heteromeles arbutifolia**	Ashy Silktassel	I/M
Lantana spp.	Toyon	C/I/M
Lotus scoparius	Lantana	C/I/D
Mahonia spp.	Deerweed	C/I
	Barberry	C/I/M
Malacothamnus		
clementinus		
	San Clemente Island Bush Mallow	C
fasciculatus**		
	Mesa Bushmallow	C/I
Melaleuca spp.		
Mimulus spp.**	Melaleuca	C/I/D
Nolina	Monkeyflower	C/I (R)
parryi		
parryi ssp. wolfii	Parry's Nolina	I
Photinia spp.	Wolf's Bear Grass	D
Pittosporum	Photinia	All Zones
crassifolium		
rhombifolium		CI/I
tobira 'Wheeleri'	Queensland Pittosporum	C/I
undulatum	Wheeler's Dwarf	C/I/D
viridiflorum	Victorian Box	C/I
Plumbago auriculata	Cape Pittosporum	C/I
Prunus	Cape Plumbago	C/I/D
caroliniana		
ilicifolia**	Carolina Laurel Cherry	C
lyonii**	Hollyleaf Cherry	C
Puncia granatum	Catalina Cherry	C
Pyracantha spp.	Pomegranate	C/I/D
Quercus	Firethorn	All Zones
dumosa**		
Rhamus	Scrub Oak	C/I
alaternus		
californica**	Italian Blackthorn	C/I
Rhaphiolepis spp.	Coffeeberry	C/I/M
Rhus	Rhaphiolepis	C/I/D
integrifolia**		
laurina	Lemonade Berry	C/I
lentii	Laurel Sumac	C/I
ovata**	Pink-Flowering Sumac	C/D
trilobata**	Sugarbush	I/M
Ribes	squawbush	I
viburnifolium		
speciosum**	Evergreen Currant	C/I
Romneya coulteri	Fuschia-Flowering Gooseberry	C/I/D
Rosa	Matilija Poppy	I
californica**		
minutifolia		

Salvia spp.**	California Wild Rose	C/I
Sambucus spp.**	Baja California Wild Rose	C/I
Symphoricarpos mollis**	Sage	All Zones
Syringa vulgaris	Elderberry	C/I/M
Tecomaria capensis	Creeping Snowberry	C/I
Teucrium fruticans	Lilac	M
Toxicodendron**	Cape Honeysuckle	C/I/D
diversilobum	Bush Germander	C/I
Verbena		
lilacina	Poison Oak	I/M
Xylosma congestum		
Yucca**	Lilac Verbena	C
schidigera	Shiny Xylosma	C/I
whipplei		
	Mojave Yucca	D
	Foothill Yucca	I

GROUNDCOVERS		
Achillea**	Yarrow	All Zones
Aptenia cordifolia	Apteria	C
Arctostaphylos spp.**	Manzanita	C/I/D
Baccharis**		
pilularis	Coyote Bush	C/I/D
Ceanothus spp.**	California Lilac	C/I/M
Cerastium tomentosum	Snow-in-Summer	All Zones
Coprosma kirkii	Creeping Coprosma	C/I/D
Cotoneaster spp.	Redberry	All Zones
Drosanthemum hispidum	Rosea Ice Plant	C/I
Dudleya		
brittonii	Brittonis Chalk Dudleya	C
pulverulenta**	Chalk Dudleya	C/I
virens	Island Live Fore-ever	C
Eschscholzia californica**	California Poppy	All Zones
Euonymus fortunei		
'Carrierei'	Glossy Winter Creeper	M
'Coloratus'	Purple-Leaf Winter Creeper	M
Ferocactus viridescens**	Coast Barrel Cactus	C
Gaillardia grandiflora	Blanket Flower	All Zones
Gazania spp.	Gazania	C/I
Helianthemum spp.**	Sunrose	All Zones
Lantana spp.	Lantana	C/I/D
Lasthenia		
californica**	Common Goldfields	I
glabrata	Coastal Goldfields	C
Lupinus spp.**	Lupine	C/I/M
Myoporum spp.	Myoporum	C/I
Pyracantha spp.	Firethorn	All zones
Rosmarinus officinalis	Rosemary	C/I/D
Santolina		
chamaecyparissus	Lavender Cotton	All Zones
virens	Santolina	All Zones
Trifolium frageriferum	O'Connor's Legume	C/I
Verbena		
rigida	Verbena	All Zones
Viguiera laciniata**	San Diego Sunflower	C/I
Vinca		
minor	Dwarf Periwinkle	M

VINES		
Antigonon leptopus	San Miguel Coral Vine	C/I
Distictis buccinatoria	Blood-Red Trumpet Vine	C/I/D
Keckiella cordifolia**	Heart-Leaved Penstemon	C/I
Lonicera		
japonica 'Halliana'	Hall's Honeysuckle	All Zones
subspicata**	Chaparral Honeysuckle	C/I
Solanum		
jasminoides	Potato Vine	C/I/D

PERENNIALS		
Coreopsis		
gigantean	Giant Coreopsis	C
grandiflora	Coreopsis	All Zones
maritime	Sea Dahlia	C
verticillata	Coreopsis	C/I
Heuchera maxima	Island Coral Bells	C/I
Iris douglasiana**	Douglas Iris	C/M
Iva hayesiana**	Poverty Weed	C/I
Kniphofia uvaria	Red-Hot Poker	C/M
Lavandula spp.	Lavender	All Zones
Limonium californicum		
var. mexicanum	Coastal Statice	C
perezii	Sea Lavender	C/I
Oenothera spp.	Primrose	C/I/M
Penstemon spp.**	Penstemon	C/I/D
Satureja douglasii	Yerba Buena	C/I
Sisyrinchium		
bellum	Blue-Eyed Grass	C/I
californicum	Golden-Eyed Grass	C
Solanum		
xantii	Purple Nightshade	C/I
Zauschneria**		
californica	California Fuschia	C/I
cana	Hoary California Fuschia	C/I
'Catalina'	Catalina Fuschia	C/I

ANNUALS		
Lupinus spp.**	Lupine	C/I/M

APPENDIX D

UNDESIRABLE PLANT LIST

UNDESIRABLE PLANT LIST

The following species are highly flammable and should be avoided when planting within the first 50 feet adjacent to a structure. The plants listed below are more susceptible to burning, due to rough or peeling bark, production of large amounts of litter, vegetation that contains oils, resin, wax, or pitch, large amounts of dead material in the plant, or plantings with a high dead to live fuel ratio. Many of these species, if existing on the property and adequately maintained (pruning, thinning, irrigation, litter removal, and weeding), may remain as long as the potential for spreading a fire has been reduced or eliminated.

BOTANICAL NAME	COMMON NAME
Abies species	Fir Trees
Acacia species	Acacia (trees, shrubs, groundcovers)
*Adenostoma sparsifolium***	Red Shanks
*Adenostoma fasciculatum***	Chamise
Agonis juniperina	Juniper Myrtle
Araucaria species	Monkey Puzzle, Norfolk Island Pine
*Artemesia californica***	California Sagebrush
Bambusa species	Bamboo
Cedrus species	Cedar
Chamaecyparis species	False Cypress
Coprosma pumila	Prostrate Coprosma
Cryptomeria japonica	Japanese Cryptomeria
Cupressocyparis leylandii	Leylandii Cypress
*Cupressus forbesii***	Tecate Cypress
Cupressus glabra	Arizona Cypress
Cupressus sempervirens	Italian Cypress
Dodonea viscosa	Hopseed Bush
*Eriogonum fasciculatum***	Common Buckwheat
Eucalyptus species	Eucalyptus
*Heterotheca grandiflora***	Telegraph Plant
Juniperus species	Junipers
Larix species	Larch
Lonicera japonica	Japanese Honeysuckle
Miscanthus species	Eulalia Grass
*Muehlenbergia species***	Deer Grass
Palmae species	Palms
Picea species	Spruce Trees
*Pickeringia Montana***	Chaparral Pea
Pinus species	Pines
Podocarpus species	Fern Pine
Pseudotsuga menziesii	Douglas Fir
Rosmarinus species	Rosemary
*Salvia mellifera***	Black Sage
Taxodium species	Cypress
Taxus species	Yew
Thuja species	Arborvitae
Tsuga species	Hemlock
*Urtica urens***	Burning Nettle

** San Diego County native species

References: Gordon, H. White, T.C. 1994. Ecological Guide to Southern California Chaparral Plant Series. Cleveland National Forest.

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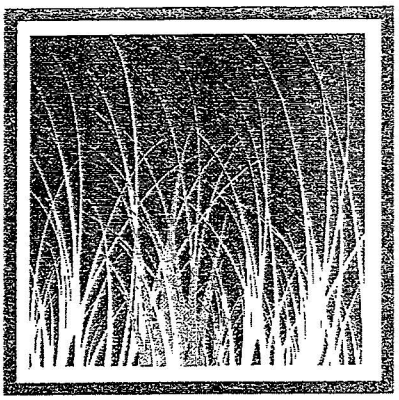
The CalEPPC List:
Exotic Pest Plants of Greatest Ecological Concern in California

October, 1999



The CalEPPC list is based on information submitted by our members and by land managers, botanists and researchers throughout the state, and on published sources. The list highlights non-native plants that are serious problems **in wildlands** (natural areas that support native ecosystems, including national, state and local parks, ecological reserves, wildlife areas, national forests, BLM lands, etc.).

List categories include:

List A: Most Invasive Wildland Pest Plants; documented as aggressive invaders that displace natives and disrupt natural habitats. Includes two sub-lists; List A-1: Widespread pests that are invasive in more than 3 Jepson regions (see page 3), and List A-2: Regional pests invasive in 3 or fewer Jepson regions.

List B: Wildland Pest Plants of Lesser Invasiveness; invasive pest plants that spread less rapidly and cause a lesser degree of habitat disruption; may be widespread or regional.

Red Alert: Pest plants with potential to spread explosively; infestations currently small or localized. If found, alert CalEPPC, County Agricultural Commissioner or California Department of Food and Agriculture.

Need More Information: Plants for which current information does not adequately describe nature of threat to wildlands, distribution or invasiveness. Further information is requested from knowledgeable observers.

Annual Grasses: New in this edition; a preliminary list of annual grasses, abundant and widespread in California, that pose significant threats to wildlands. Information is requested to support further definition of this category in next List edition.

Considered But Not Listed: Plants that, after review of status, do not appear to pose a significant threat to wildlands.

Plants that fall into the following categories are not included in the List:

- Plants found mainly or solely in disturbed areas, such as roadsides and agricultural fields.
- Plants that are established only sparingly, with minimal impact on natural habitats.

1999 List Review Committee:

Dr. Lars W.J. Anderson, Research Leader
U.S. Dept.of Agriculture-ARS
Aquatic Weed Research Lab.

Dr. Joe DiTomaso, Extension Weed Ecologist
Weed Science Program
Department of Vegetable Crops
University of California, Davis

Dr. G. Fred Hrusa, Senior Plant Systematist
Plant Pest Diagnostics Center
California Department of Food & Agriculture

Dr. Marcel Rejmánek, Professor of Plant Ecology
Section of Evolution and Ecology
University of California, Davis

CalEPPC List Committee:

Ann Howald, Instructor
Santa Rosa Junior College

Dr. John Randall, Invasive Weed Specialist
The Nature Conservancy

Jake Sigg, President
California Native Plant Society

Ellie Wagner, Botanist
California Dept. of Transportation

Peter Warner, Restoration Coordinator
Golden Gate National Parks Association

The CalEPPC list is updated regularly. Please use the form provided to send comments, suggestions or new information to: **Peter Warner, 555 Magnolia Avenue, Petaluma, CA, 94952-2080**, or via email at **peterjwarner@earthlink.net**.

Thanks to all those who submitted comments for the 1999 list.

List A-1: Most Invasive Wildland Pest Plants; Widespread

Latin Name[1]	Common Name	Habitats of Concern and Other Comments	Distribution[2]
Ammophila arenaria	European beach grass	Coastal dunes	SCo,CCo,NCo
Arundo donax	giant reed, arundo	Riparian areas	cSNF,CCo,SCo,SnGb,D,GV
Bromus tectorum	cheat grass, downy brome	Sagebrush, pinyon-juniper, other desert communities; increases fire frequency	GB,D
Carpobrotus edulis	iceplant, sea fig	Many coastal communities, esp. dunes	SCo,CCo,NCo,SnFrB
Centaurea solstitialis[C]	yellow starthistle	Grasslands	CA-FP (uncommon in SoCal)
Cortaderia jubata	Andean pampas grass, jubatagrass	Horticultural; many coastal habitats, esp. disturbed or exposed sites incl. logged areas	NCo,NCoRO,SnFrB, CCo,WTR,SCo
Cortaderia selloana	pampas grass	Horticultural; coastal dunes, coastal scrub, Monterey pine forest, riparian, grasslands; wetlands in ScV; also on serpentine	SnFrB,SCo,CCo,ScV
Cynara cardunculus[B]	artichoke thistle	Coastal grasslands	CA-FP, esp. CCo,SCo
Cytisus scoparius[C]	Scotch broom	Horticultural; coastal scrub, oak woodlands, Sierra foothills	NW,CaRF,SNF,GV, SCo,CW
Eucalyptus globulus	Tasmanian blue gum	Riparian areas, grasslands, moist slopes	NCoRO,GV,SnFrB, CCo,SCoRO,SCo,nChI
Foeniculum vulgare	wild fennel	Grasslands; esp. SoCal, Channel Is.; the cultivated garden herb is not invasive	CA-FP
Genista monspessulana[C]	French broom	Horticultural; coastal scrub, oak woodlands, grasslands	NCoRO,NCoRI,SnFrB, CCo,SCoRO,sChI,WTR,PR
Lepidium latifolium[B]	perennial pepperweed, tall whitetop	Coastal, inland marshes, riparian areas, wetlands, grasslands; potential to invade montane wetlands	CA (except KR,D)
Myriophyllum spicatum	Eurasian watermilfoil	Horticultural; lakes, ponds, streams, aquaculture	SnFrB,SnJV,SNH(?); prob. CA
Pennisetum setaceum	fountain grass	Horticultural; grasslands, dunes, desert canyons; roadsides	Deltaic GV,CCo,SCo, SnFrB
Rubus discolor	Himalayan blackberry	Riparian areas, marshes, oak woodlands	CA-FP
Senecio mikanioides (=*Delairea odorata*)	Cape ivy, German ivy	Coastal, riparian areas, also SoCal (south side San Gabriel Mtns.)	SCo,CCo,NCo,SnFrB,SW
Taeniatherum caput-medusae[C]	medusa-head	Grasslands, particularly alkaline and poorly drained areas	NCoR,CaR,SNF,GV,SCo
Tamarix chinensis, T. gallica, T. parviflora & T. ramosissima	tamarisk, salt cedar	Desert washes, riparian areas, seeps and springs	SCo,D,SnFrB,GV,sNCoR, sSNF,Teh,SCoRI,SNE, WTR
Ulex europaeus[B]	gorse	North, central coastal scrub, grasslands	NCo,NCoRO,CaRF, n&cSNF,SnFrB,CCo

[1]Noxious Weed Ratings

F: Federal Noxious Weed, as designated by the USDA; targeted for federally-funded prevention, eradication or containment efforts.

A: CA Dept. of Food & Agriculture, on "A" list of Noxious Weeds; agency policies call for eradication, containment or entry refusal.

B: CA Dept. of Food & Agriculture, on "B" list of Noxious Weeds; includes species that are more widespread, and therefore more difficult to contain; agency allows county Agricultural Commissioners to decide if local eradication or containment is warranted.

C: CA Dept. of Food & Agriculture, on "C" list of Noxious Weeds; includes weeds that are so widespread that the agency does not endorse state or county-funded eradication or containment efforts except in nurseries or seed lots.

Q: CA Dept. of Food & Agriculture's designation for temporary "A" rating pending determination of a permanent rating.

For most species nomenclature follows *The Jepson Manual: Higher Plants of California* (Hickman, J., Ed., 1993).

List A-2: Most Invasive Wildland Pest Plants; Regional

Latin Name[1]	Common Name	Habitats of Concern and Other Comments	Distribution[2]
Ailanthus altissima	tree of heaven	Riparian areas, grasslands, oak woodlands, esp. GV, SCo	CA-FP
Atriplex semibaccata	Australian saltbush	SoCal, coastal grasslands, scrub, "high marsh" of coastal salt marshes	CA (except CaR,c&sSN)
Brassica tournefortii	Moroccan or African mustard	Washes, alkaline flats, disturbed areas in Sonoran Desert	SW,D
Bromus madritensis ssp. *rubens*	red brome	Widespread; contributing to SoCal scrub, desert scrub type conversions; increases fire frequency	CA
Cardaria draba[B]	white-top, hoary cress	Riparian areas, marshes of central coast; also ag. lands, disturbed areas	Problem only in CCo
Conicosia pugioniformis	narrow-leaved iceplant, roundleaf iceplant	Coastal dunes, sandy soils near coast; best documented in San Luis Obispo and Santa Barbara cos.	CCo
Cotoneaster pannosus, *C. lacteus*	cotoneaster	Horticultural; many coastal communities; esp. North Coast, Big Sur; related species also invasive	CCo,SnFrB,NW
Cytisus striatus	striated broom	Often confused with C. scoparius; coastal scrub, grassland	SnFrB,CCo,SCo,PR
Egeria densa	Brazilian waterweed	Streams, ponds, sloughs, lakes; Sacramento-San Joaquin Delta	n&sSNF,SnJV,SnFrB, SnJt,SNE
Ehrharta calycina	veldt grass	Sandy soils, esp. dunes; rapidly spreading on central coast	CCo,SCoRO,WTR
Eichhornia crassipes	water hyacinth	Horticultural; established in natural waterways, esp. troublesome in Sacramento-San Joaquin Delta	GV,SnFrB,SCo,PR
Elaeagnus angustifolia	Russian olive	Horticultural; interior riparian areas	SnJV,SnFrB,SNE,DMoj
Euphorbia esula[A]	leafy spurge	Rangelands in far no. CA, also reported from Los Angeles Co.	eKR,NCo,CaR,MP,SCo
Ficus carica	edible fig	Horticultural; Central Valley, foothill, South Coast and Channel Is. riparian woodlands	nSNF,GV,SnFrB,SCo
Lupinus arboreus	bush lupine	Native to SCo, CCo; invasive only in North Coast dunes	SCo,CCo,NCo
Mentha pulegium	pennyroyal	Santa Rosa Plain (Sonoma Co.) and Central Valley vernal pools; wetlands elsewhere	NW,GV,CW,SCo
Myoporum laetum	myoporum	Horticultural; coastal riparian areas in SCo	SCo,CCo
Saponaria officinalis	bouncing bet	Horticultural; meadows, riparian habitat in SNE, esp. Mono Basin	NW,CaRH,nSNF,SnFrB, SCoRO,SCo,PR,MP,SNE, GV
Spartina alterniflora	Atlantic or smooth cordgrass	S.F. Bay salt marshes; populations in Humboldt Bay believed extirpated	CCo(shores of S.F. Bay)

[2]Distribution by geographic subdivisions per the Jepson Manual

CA=California
CA-FP=California Floristic Province
CaR=Cascade Ranges
CaRF=Cascade Range Foothills
CCo=Central Coast
ChI=Channel Islands
CW=Central Western CA
D=Deserts
DMoj=Mojave Desert
DSon=Sonoran Desert
GB=Great Basin
GV=Great Valley
KR=Klamath Ranges
MP=Modoc Plateau
NCo=North Coast
NCoRI=Inner NCo Ranges
NCoRO=Outer NCo Ranges
NW=Northwestern CA
PR=Peninsular Ranges
SCo=South Coast
SCoRI=Inner SCo Ranges
SCoRO=Outer SCo Ranges
ScV=Sacramento Valley
SnJV=San Joaquin Valley
SN=Sierra Nevada
SNE=East of SN
SNF=SN Foothills
SNH=High SN
SnFrB=San Francisco Bay Area
SnGb=San Gabriel Mtns
SW=Southwestern CA
Teh=Tehachapi Mtns
WTR=Western Transverse Ranges

List B: Wildland Pest Plants of Lesser Invasiveness

Latin Name[1]	Common Name	Habitats of Concern and Other Comments	Distribution[2]
Ageratina adenophora[F]	eupatory	Horticultural; coastal canyons, coastal scrub, slopes, Marin to San Diego Co; San Gabriel Mtns.	CCo,SnFrB,SCo,SCoRO
Bassia hyssopifolia	bassia	Alkaline habitats	CA (except NW,SNH)
Bellardia trixago	bellardia	Grasslands, on serpentine, where a threat to rare natives	NCoRO,CCo,SnFrB
Brassica nigra	black mustard	Coastal communities, esp. fog-belt grasslands; disturbed areas	CA-FP
Cardaria chalepensis[B]	lens-podded white-top	Wetlands of Central Valley	CA
Carduus pycnocephalus[C]	Italian thistle	Grasslands, shrublands, oak woodlands	sNCo,sNCoR,SNF,CW, SCo,ScV
Centaurea calcitrapa[B]	purple starthistle	Grasslands	NW,sCaRF,SNF,GV,CW,SW
Centaurea melitensis	tocalote, Malta starthistle	Widespread; sometimes misidentified as C. solstitialis; perhaps a more serious invader than currently recognized	CA-FP,D
Cirsium arvense[B]	Canada thistle	Especially troublesome in riparian areas	CA-FP
Cirsium vulgare	bull thistle	Riparian areas, marshes, meadows	CA-FP,GB
Conium maculatum	poison hemlock	Mainly disturbed areas but may invade wildlands; known to poison wildlife; early expanding stage in many areas, esp. San Diego Co. riparian, oak understory	CA-FP
Crataegus monogyna	hawthorn	Horticultural; recent invader, colonizing healthy native forest around Crystal Springs reservoir on S.F. peninsula	SnFrB,CCo,NCo,NCoR
Ehrharta erecta	veldt grass	Wetlands, moist wildlands; common in urban areas; potential to spread rapidly in coastal, riparian, grassland habitats	SnFrB,CCo,SCo
Erechtites glomerata, E. minima	Australian fireweed	Coastal woodlands, scrub, NW forests, esp. redwoods	NCo,NCoRO,CCo,SnFrB, SCoRO
Festuca arundinacea	tall fescue	Horticultural (turf grass); coastal scrub, grasslands in NCo, CCo	CA-FP
Hedera helix	English ivy	Horticultural; invasive in coastal forests, riparian areas	CA-FP
Holcus lanatus	velvet grass	Coastal grasslands, wetlands in No. CA	CA exc. DSon
Hypericum perforatum[C]	Klamathweed, St. John's wort	Redwood forests, meadows, woodlands; invasion may occur due to lag in control by established biocontrol agents	NW,CaRH,n&cSN,ScV, CCo,SnFrB,PR
Ilex aquifolium	English holly	Horticultural; coastal forests, riparian areas	NCoRO,SnFrB,CCo
Iris pseudacorus	yellow water iris, yellow flag	Horticultural; riparian, wetland areas, esp. San Diego, Los Angeles cos.	SnFrB,CCo,sSnJV,SCo
Leucanthemum vulgare	ox-eye daisy	Horticultural; invades grassland, coastal scrub	KR,NCoRO,n&cSNH, SnFrB,WTR,PR
Mesembryanthemum crystallinum	crystalline iceplant	Coastal bluffs, dunes, scrub, grasslands; concentrates salt in soil	NCo,CCo,SCo,ChI
Myriophyllum aquaticum	parrot's feather	Horticultural; streams, lakes, ponds	NCo,CaRF,CW,SCo
Olea europaea	olive	Horticultural and agricultural; reported as invasive in riparian habitats in Santa Barbara, San Diego	NCoR,NCoRO,CCo, SnFrB,SCoRO,SCo
Phalaris aquatica	Harding grass	Coastal sites, esp. moist soils	NW,cSNF,CCo,SCo
Potamogeton crispus	curlyleaf pondweed	Scattered distribution in ponds, lakes, streams	NCoR,GV,CCo,SnFrB, SCo,ChI,SnGb,SnBr,DMoj
Ricinus communis	castor bean	SoCal coastal riparian habitats	GV,SCo,CCo
Robinia pseudoacacia	black locust	Horticultural; riparian areas, canyons; native to eastern U.S.	CA-FP,GB
Schinus molle	Peruvian pepper tree	Horticultural; invasive in riparian habitats in San Diego, Santa Cruz Is.	SNF,GV,CW,SW,Teh

List B: Continued

Latin Name[1]	Common Name	Habitats of Concern and Other Comments	Distribution[2]
Schinus terebinthifolius	Brazilian pepper	Horticultural; riparian areas	sSCo
Senecio jacobaea[B]	tansy ragwort	Grasslands; biocontrol agents established	NCo,wKR,s&wCaR, nSNF, nScV,SW
Spartium junceum	Spanish broom	Coastal scrub, grassland, wetlands, oak woodland, NW forests, esp. redwoods; also roadcuts	NCoRO,ScV,SnFrB, SCoRO,SCo,sChI,WTR
Verbascum thapsus	woolly or common mullein	SNE meadows, sagebrush, pinyon-juniper woodlands; shores of Boggs Lake (Lake Co.)	CA
Vinca major	periwinkle	Horticultural; riparian, oak woodland, other coastal habitats	NCoRO,SnFrB, CCo, sSCoRO,SCo

Red Alert: Species with potential to spread explosively; infestations currently restricted

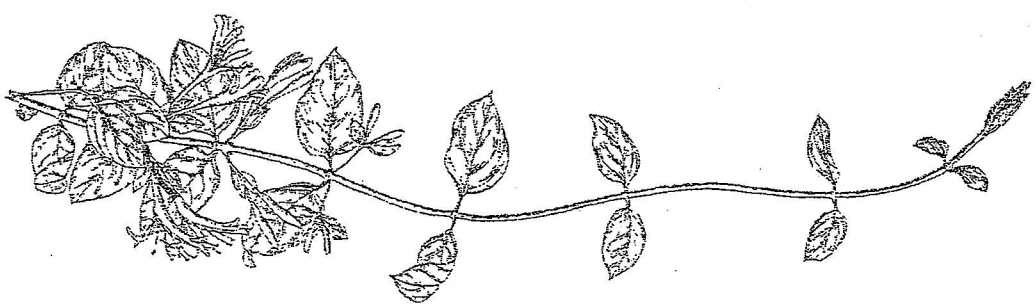
Latin Name[1]	Common Name	Habitats of Concern and Other Comments	Distribution[2]
Alhagi pseudalhagi[A]	camel thorn	Noxious weed of arid areas; most infestations in California have been eradicated	GV,sSNE,D
Arctotheca calendula[A]	Capeweed	Seed-producing types are the problem; most are vegetative only	NCo,SnFrB,CCo
Centaurea maculosa[A]	spotted knapweed	Riparian, grassland, wet meadows, forest habitats; contact CA Food & Ag if new occurrences found	CaR,SN,nScV,nCW,MP, nSNE,sPR,NW
Crupina vulgaris[F,A]	bearded creeper, common crupina	Aggressively moving into wildlands, esp. grassland habitats	NCoR (Sonoma Co.),MP
Halogeton glomeratus[A]	halogeton	Noxious weed of Great Basin rangelands; report locations to CA Food & Ag; goal is exclusion from CA	GB
Helichrysum petiolare	licorice plant	North coastal scrub; one population on Mt. Tamalpais, w. Marin Co.	Not in Jepson
Hydrilla verticillata[F,A]	hydrilla	Noxious water weed; report locations to CA Food & Ag; eradication program in place; found in Clear Lake (Lake Co.) in 1994	NCoRI,n&cSNF,ScV,SCo,D
Lythrum salicaria[B]	purple loosestrife	Horticultural; noxious weed of wetlands, riparian areas	sNCo,NCoRO,nSNF,ScV, SnFrB,nwMP
Ononis alopecuroides[Q]	foxtail restharrow	Eradication efforts underway in San Luis Obispo Co.; to be looked for elsewhere in CA	CCo; not in Jepson
Retama monosperma	bridal broom	First noted at Fallbrook Naval Weapons Station, San Diego Co; could rival other invasive brooms	San Diego Co.; not in Jepson
Salvinia molesta[F]	giant waterfern	Ponds, lakes, reservoirs, canals	Napa, Sonoma cos., lower Colorado River; not in Jepson
Sapium sebiferum	Chinese tallow tree	Horticultural; riparian, wetland habitats, open areas and understory	ScV,SnFrB; not in Jepson
Sesbania punicea	scarlet wisteria tree	Horticultural; riparian areas; American River Parkway, Sacramento Co., Suisun Marsh, San Joaquin River Parkway	ScV,SnJV; not in Jepson
Spartina anglica	cord grass	Scattered in S.F. Bay	Not in Jepson
Spartina densiflora	dense-flowered cord grass	Scattered in S.F. Bay, Humboldt Bay salt marshes	CCo,NCo
Spartina patens	salt-meadow cord grass	One site in S.F. Bay, also Siuslaw Estuary, OR and Puget Sound, WA	CCo

Need More Information

Latin Name[1]	Common Name	Habitats of Concern and Other Comments	Distribution[2]
Acacia dealbata	silver wattle	Aggressive in natural areas?	SnFRB,SCoRO,SCoRI,CCo
Acacia decurrens	green wattle	Sometimes confused with A. dealbata; aggressive in natural areas?	Unknown
Acacia melanoxylon	blackwood acacia	Reported from S.F. Bay area, central coast, Santa Cruz Is.; spreads slowly; other areas?	SnFrB,SCoRO,SCo,CCo
Aeschynomene rudis[B]	rough jointvetch	Princeton area, Colusa Co.; pest of rice crops; potential threat to riparian, wetland habitats?	ScV
Agrostis avenacea	Pacific bentgrass	Invading vernal pools in San Diego area; attempts at manual eradication unsuccessful so far; problem in other areas?	sNCo,sNCoR,SNF, GV,CW,nSCo
Aptenia cordifolia	red apple	Habitats where invasive?	CCo,SCo,sChI
Asphodelus fistulosus	asphodel	Common in SCo highway rights-of-way, other disturbed sites; threats to wildlands?	sSnJV,SCo
Carduus acanthoides[A]	giant plumeless thistle	Threatens wildlands?	NCoRI,nSN,SnFrB, nSCoRO,MP
Cistus ladanifer	gum cistus	Horticultural; invades coastal sage scrub, chaparral; areas where problematic?	sCCo,SnGb
Cordyline australis	New Zealand cabbage	Infestation at Salt Point State Park; bird-dispersed; other problem areas?	Not in Jepson
Cotoneaster spp. (exc. C. pannosus, C. lacteus)	cotoneaster	Horticultural; bird-distributed; which species are problems in wildlands?	Unknown
Cupressus macrocarpa	Monterey cypress	Native only to Monterey Peninsula; planted and naturalized CCo, NCo; threat to wildlands?	CCo
Descurainia sophia	flixweed, tansy mustard	Entering Mojave wildlands through washes; threat to wildlands?	CA
Dimorphotheca sinuata	African daisy, Cape marigold	Horticultural; reported as invasive in w. Riverside Co., Ventura Co.; problem elsewhere?	SnJV,SCoRO,SCo,PR
Echium candicans, E. pininana	pride of Madeira, pride of Teneriffe	Horticultural; riparian, grassland, coastal scrub communities; spreads by seed	CCo,SnFrB,SCo,sNCo
Ehrharta longiflora	veldt grass	Reported from San Diego	Not in Jepson
Erica lusitanica	heath	Threat to wildlands?	NCo (Humboldt Co.)
Euphorbia lathyris	caper spurge, gopher plant	Invades coastal scrub, marshes, dunes; Sonoma, Marin cos.; threat to wildlands?	NCo,CCo,GV,SCo
Gazania linearis	gazania	Horticultural; invades grassland in S.F., coastal scrub?	CCo,SCo
Glyceria declinata		Although reported from Central Valley vernal pools, genetic research is needed to confirm identity; plants that have been called G. declinata key in Jepson to native G. occidentalis	Uncertain; not in Jepson
Hedera canariensis	Algerian ivy	Horticultural; invasive in riparian areas in SoCal?	Not in Jepson
Hirschfeldia incana	Mediterranean or short-pod mustard	Increasing in western, southern Mojave; threat to wildlands?	NCo,SNF,GV,CW,SCo, DMoj
Hypericum canariense	Canary Island hypericum	Reported in San Diego area, coastal sage scrub, grassland; threat to wildlands?	SCo
Hypochaeris radicata	rough cat's-ear	Widespread in coastal grasslands, wetlands; threat to wildlands?	NW,CaRF,nSNF,ScV, CW,SCo
Isatis tinctoria[B]	dyers' woad	Well-known invader in Utah; threat to wildlands?	KR,CaR,nSNH,MP
Ligustrum lucidum	glossy privet	Horticultural; spreading rapidly on Mendocino coast; problem in other areas?	NCo; not in Jepson
Limonium ramosissimum ssp. provinciale	sea lavender	Reported spreading in Carpinteria Salt Marsh; problem in other areas?	Not in Jepson

Need More Information: Continued

Latin Name[1]	Common Name	Habitats of Concern and Other Comments	Distribution[2]
Ludwigia uruguayensis (= *L. hexapetala*)	water primrose	Invasive in aquatic habitats; non-native status questioned?	NCo,sNCoRO,CCo, SnFrB.SCo
Malephora crocea	ice plant	Invades margins of wetlands, bluffs along SCo	CCo,SCo,sChI
Maytenus boaria	mayten	Horticultural; scattered in riparian forests, ScV; east SnFrB	ScV,SnFrB
Mesembryanthemum nodiflorum	slender-leaved iceplant	Abundant on Channel Islands; invades wetlands; habitats where problematic?	SnFrB,SCo,ChI
Nicotiana glauca	tree tobacco	Disturbed places; not very competitive with natives in coastal scrub, chaparral; spreading along Putah Creek (Yolo Co.); problems elsewhere?	NCoRI,c&sSNF, GV,CW,SW,D
Oxalis pes-caprae	Bermuda buttercup	Invades disturbed sites; invasive in undisturbed habitats?	NCo,NCoRO,CCo, SnFrB,SCoRO,SCo
Parentucellia viscosa		Threat to NCo (Humboldt Co.) dune swales?	NCo,NCoRO,CCo,SCo
Passiflora caerulea		Horticultural; reported from SoCal; threat to wildlands?	SCo; not in Jepson
Pennisetum clandestinum[F,C]	Kikuyu grass	Disturbed sites, roadsides; threat to wildlands?	NCo,CCo,SnFrB,SCo, Santa Cruz Is.
Phyla nodiflora	mat lippia	Most varieties in CA are native; taxonomy unclear; status of plants in vernal pools, wetlands?	NW(except KR,NCoRH), GV,CCo,SnFrB,SCo, PR,DSon
Pinus radiata cultivars	Monterey pine	Cultivars invading native Monterey, Cambria forests, where spread of pine pitch canker is a concern	CCo
Piptatherum miliaceum	smilo grass	Aggressive in SoCal creeks, canyons; threats to wildlands?	NCo,GV,CW,SCo
Pistacia chinensis	Chinese pistache	Horticultural; invades riparian areas and woodlands in ScV	ScV
Prunus cerasifera	cherry plum	Oak woodland, riparian areas; esp. Marin, Sonoma cos.; bird-distributed; problems elsewhere?	SnFrB,CCo
Pyracantha angustifolia	pyracantha	Horticultural; spreads from seed in S.F. Bay area; bird-distributed; problem elsewhere?	sNCoRO,CCo,SnFrB, SCo
Salsola soda	glasswort	Threat to salt marshes?	nCCo,SnFrB
Salsola tragus[C]	Russian thistle, tumbleweed	Abundant in dry open areas in w. Mojave Desert, Great Basin; not limited to disturbed sites; threats?	CA
Salvia aethiopis[B]	Mediterranean sage	Creates monocultures in E. Oregon grasslands; threat to CA wildlands?	MP
Stipa capensis		Distribution and threats?	Not in Jepson
Tamarix aphylla	athel	Spreading in Salton Sea area; threats to wildlands?	nSnJV,nSCo,D
Tanacetum vulgare	common tansy	Jepson reports as uncommon, escape from cultivation in urban areas; problem in wildlands?	NCo,NCoRO,CaRH, SCoRO
Verbena bonariensis, *V. litoralis*	tall vervain	Horticultural; invades riparian forests, wetlands; extensive along ScV riparian corridors; roadsides (Yuba Co.); elsewhere?	ScV,nSnJV,nSnFrB,CCo



Annual Grasses

Latin Name[1]	Common Name	Habitats of Concern and Other Comments	Distribution[2]
Aegilops triuncialis[B]	barbed goatgrass	Serpentine soils, grasslands	sNCoR,CaRF, n&cSNF, ScV,nCW
Avena barbata	slender wild oat	Lower elev. in SoCal; coastal slopes, coastal sage scrub, disturbed sites	CA-FP,MP,DMoj
Avena fatua	wild oat	Lower elev. in SoCal; coastal slopes, coastal sage scrub on deeper soil, disturbed sites	CA-FP,MP,DMoj
Brachypodium distachyon	false brome	Expanding in SoCal; common in Orange Co.	sNCoR,sCaRF, SNF,GV,CW,SCo,sChI
Bromus diandrus	ripgut brome	Coastal dunes, coastal sage scrub, grasslands	CA
Lolium multiflorum	Italian ryegrass	Wetland areas, esp. vernal pools in San Diego Co.; common in disturbed sites	CA-FP
Schismus arabicus	Mediterranean grass	Threat to Mojave and Colorado desert shrublands?	SnJV,CW,sChI,D
Schismus barbatus	Mediterranean grass	Threat to Mojave and Colorado desert shrublands?	SnJV,SW,D

Considered, but not listed

Latin Name[1]	Common Name	Habitats of Concern and Other Comments
Albizia lophantha	plume acacia	Not invasive
Anthoxanthum odoratum	sweet vernal grass	Disturbed sites on coast; Marin, Sonoma, Mendocino cos.
Carpobrotus chilensis	sea fig	Native status in question; not a threat to wildlands
Centranthus ruber	red valerian	Horticultural; roadcuts in Marin Co.; not a threat to wildlands
Convolvulus arvensis[C]	field bindweed	Disturbed sites; ag lands
Coprosma repens	mirror plant	No evidence of wildland threat
Crocosmia x crocosmiiflora		Generally in disturbed coastal, urban areas, roadsides
Digitalis purpurea	foxglove	Horticultural; scattered in prairies, meadows, disturbed sites; not a major wildland threat
Dipsacus sativus, D. fullonum	wild teasel, Fuller's teasel	Roadsides, disturbed sites
Fumaria officinalis, F. parviflora	fumitory	S.F. Bay area, Monterey Bay salt marshes, sandy disturbed sites
Medicago polymorpha	California bur clover	Grasslands, moist sites; mainly restricted to disturbed sites
Melilotus officinalis	yellow sweet clover	Restricted to disturbed sites in CA
Nerium oleander	oleander	Horticultural; not invasive, although reported from riparian areas in Central Valley, San Bernardino Mtns.
Picris echioides	bristly ox-tongue	Disturbed areas
Silybum marianum	milk thistle	Disturbed areas, especially overgrazed moist pasturelands; may interfere with restoration
Xanthium spinosum	spiny cocklebur	Identified as native in *The Jepson Manual* (Hickman, 1993) and *A California Flora* (Munz and Keck, 1968); restricted to disturbed areas
Zantedeschia aethiopica	calla lily	Horticultural; mainly a garden escape in wet coastal areas
Zoysia cultivars	Amazoy and others	Horticultural; no evidence of wildland threat